RESULTS

OF THE

MAGNETICAL AND METEOROLOGICAL

OBSERVATIONS

MADE AT

THE ROYAL OBSERVATORY, GREENWICH,

1868.

(EXTRACTED FROM THE GREENWICH OBSERVATIONS, 1868.)

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GREENWICH MAGNETICAL AND METEOROLOGICAL OBSERVATIONS, 1868.

Introduction.

§ 1. *Buildings of the Magnetic Observatory.*

In consequence of a representation by the Astronomer Royal, dated 1836, January 12, and a memorial by the Board of Visitors of the Royal Observatory, dated 1836, February 26, addressed to the Lords Commissioners of the Admiralty, an additional space of ground on the south-east side of the former boundary of the Observatory grounds was inclosed from Greenwich Park for the site of a Magnetic Observatory, in the summer of 1837, and the Magnetic Observatory was erected in the spring of 1838. Its nearest angle in its present form is about 174 feet from the nearest point of the S.E. dome, and about 30 feet from the office of Clerk of Works. It is based on concrete and built of wood, united for the most part by pegs of bamboo; no iron was intentionally admitted in its construction, or in subsequent alterations. Its form, as originally built, was that of a cross with four equal arms, very nearly in the direction of the cardinal magnetic points as they were in 1838; the length within the walls, from the extremity of one arm of the cross to the extremity of the opposite arm, was 40 feet, the breadth of each arm 12 feet. In the spring of 1862, the northern arm was extended 8 feet. The height of the walls inside is 10 feet, and the ceiling of the room is about 2 feet higher. The northern arm of the cross is separated from the central square by a partition, so as to form an ante-room. The meridional magnet, for observations of absolute declination and of variations of declination (placed in its position in 1838), is mounted in the southern arm; and the theodolite by which the magnet collimator is viewed, and by which circumpolar stars for determination of the astronomical meridian are also observed (for which observation an opening is made in the roof, with proper shutters,) is in the southern arm, near the southern boundary of the central square. The bifilar magnet, for variations of horizontal magnetic force (erected at the end of 1840) was mounted near the northern wall of the eastern arm; and the balance-magnetometer, for variations of vertical magnetic force (erected in 1841) was mounted near the northern wall of the western arm. Important changes have lately been made in the positions of these instruments, as will be mentioned below. The sidereal time-clock is in the south arm, near the south-east re-entering angle. The fire-grate (constructed of copper, as far as possible,) is near the north end of the west side of the ante-room. Some of these fixtures may contain trifling quantities of iron, and, as the ante-room is used as a computing room it is impossible to avoid the introduction of iron in small quantities; great care, however, is taken to avoid it as far as possible.

In 1864, a room, called the Magnetic Basement, was excavated below the whole of the Magnetic Observatory except the ante-room; the descent to it is by a staircase close to the south wall of the western arm of the building.

For the theodolite, a brick pier was built from the ground below the floor of the Basement, rising through the ceiling into the south arm of the upper room, and supporting the theodolite in exactly the same position as before.

Instead of a single meridional magnet performing the double functions of "magnet for determining absolute magnetic declination," and "magnet carrying a mirror for photographic register," there are now two meridional magnets, one in the Upper Room and one in the Basement. The upper magnet is in a position about 10 inches north of the former position of the declination-magnet; it carries a collimator, for observation by the theodolite; but, in reversion of position of the collimator, the collimator is always either above or below the magnet, so that the magnet is always in the same vertical. The lower magnet, which is in the same vertical with the upper magnet, carries the mirror for the photographic register of the continual changes of declination. A massive brick pier is built in the south arm of the Basement, covered by a stone slab; upon it is fixed the gun-metal stand carrying the photographic lamp, and the narrow chink through which it shines; from the stone slab rise three smaller piers, upon which crossed slates are placed; and from these rises a small pier through the ceiling, to the height of 18 inches above the upper floor, carrying the suspension of the lower magnet; the skein of silk, which supports the lower magnet, passes through a hole in one of the slates. Upon the tops of the three piers rest the feet of the original wooden stand carrying the suspension of the upper magnet.

The bifilar-magnetometer is in the Basement, in a position vertically below its former position. A massive brick pier, surmounted by a thick slab of stone (upon which the metal stand carrying the photograph lamp and narrow chink is fixed) carries a pier consisting of a back and return-sides, which rises through the ceiling about 2 feet above the upper floor, and is crowned by a slate slab that carries the suspension of the bifilar-magnetometer.

The vertical-force magnetometer is in the Basement, in a position vertically below its former position; it rests upon a brick pier, capped by a thick stone; to which also is fixed the plate of metal with narrow chink through which passes the light of the photographic lamp.

To the theodolite-pier are fixed telescopes for eye-observation of the bifilar and vertical-force magnetometers.

At the south-east re-entering angle of the Basement (which has been rebated for the purpose) is the horizontal photographic cylinder, which receives the traces of the movements of the declination-magnet and the bifilar-magnet. The angle is so far cut away that the straight line joining their suspensions passes at the distance of one foot from the wall, and thus the cylinder receives the light from the concave mirrors carried by both instruments, at right angles to its surface. The vertical cylinder which receives the traces of the movements of the vertical-force-magnet, and of the self-registering barometer near it, is east of the vertical force pier.

In the south-west corner of the western arm, and partially beneath the staircase, is the apparatus for self-registration of the spontaneous galvanic currents on the wires leading respectively, from Angerstein Wharf to Lady Well Station (on the Mid Kent Railway), and from North Kent Junction (on the Greenwich Railway) to Morden College end of the Blackheath Tunnel (on the North Kent Railway). The straight lines connecting these points intersect each other nearly at right angles, at a point not far distant from the Observatory (see § 13 below).

The mean-time-clock is on the west wall of the south arm of the Basement.

Adjoining the north wall is the table for photographic operations. Much water is used in these operations, and therefore a pump is provided in the grounds at a distance of about 30 feet from the nearest magnetometer, by which the water is withdrawn from the cistern at the east end of the photographic table and at once discharged into a covered drain.

The Basement is warmed by a gas-stove, and ventilated by a large copper tube nearly two feet in diameter, receiving the flues from the stove and all the lamps, and passing through the upper room to a revolving cowl above the roof. Each of the arms of the basement has a window facing the south, but in general the window-wells are closely stopped.

The variations in the temperature of the instruments have been greatly reduced by their location within this Basement.

On the outside of the Magnetic Observatory, near the north-east corner of the ante-room, a pole 79 feet in height is fixed, for the support of the conducting wires to the electrometers; the electrometers, &c., are planted in the window-seat at the north-end of the ante-room.

The apparatus for naphthalizing the gas used in the photographic registration was formerly fixed in a corner of the ante-room, but is now (1868) mounted in a small detached zinc-built room, erected in 1863, near the west side of the ante-room. No naphthalizing process, however, has been in use since the year 1865.

In 1863, a range of seven rooms, usually called the Magnetic Offices, was erected near the southern fence of the grounds. Since the summer of 1863, observations of Dip and Deflexion have been made in the westernmost of these rooms.

At the distance of 28 feet south (magnetic) from the south-east angle of the southern arm is a square shed about $10^{ft}\ 6^{in}$ square, supported by four posts at the height 8 feet, with an adjustable opening at the center of the top. Under this shed are placed the large dry-bulb and wet-bulb thermometers, with a photographic cylinder, whose axis is vertical, between them; and external to these are the gas flames, whose light passing through the thermometer-tubes above the quicksilver makes photographic traces upon the paper which covers the cylinder.

For better understanding of these descriptions, the reader is referred to the Descriptions of Buildings and Grounds with accompanying Maps, attached to the Volumes of Astronomical Observations for the years 1845 and 1862.

§ 2. *Upper Declination-Magnet and Apparatus for observing it.*

The theodolite with which the meridional magnet is observed is by Simms: the radius of its horizontal circle is 8·3 inches: it is divided to 5′, and reads to 5″, by three verniers, carried by the revolving frame of the theodolite. The fixed frame stands upon three foot-screws, which rest in brass channels let into a stone pier, that stands upon the brick pier rising from the ground of the Magnetic Basement. The revolving frame carries the Y's (with vertical adjustment at one end) for a telescope with transit-axis: the length of the axis is $10\frac{1}{2}$ inches: the length of the telescope 21 inches: the aperture of the object glass 2 inches. The Y's are not carried immediately by the T head which crosses the vertical axis of the revolving frame, but by pieces supported by the ends of that T head, and projecting horizontally from it: the use of this construction is to allow the telescope to be pointed sufficiently high to see δ Ursæ Minoris above the pole. The eye-piece of the telescope carries only one fixed horizontal wire, and one vertical wire moved by a micrometer-screw. The opening in the roof of the building permits the observation of circumpolar stars, as high as δ Ursæ Minoris above the pole, and as low as β Cephei below the pole.

For supporting the magnet, a braced wooden tripod-stand is provided, whose feet, as above described, rest upon brick piers in the Magnetic Basement. Upon the cross-bars of the stand rests a double rectangular box (one box completely inclosed within another), both boxes being covered with gilt paper on their exterior and interior sides. On the southern side of the principal upright piece of the stand is a moveable upright bar, turning in the vertical E. and W. plane, upon a pin in its center (which is fixed in the principal upright), and carrying at its top the pulleys for suspension of the magnet; this construction is adopted as convenient for giving an E. and W. movement (now very rarely required) to the point of suspension, by giving a motion to the lower end of the bar. The top of the upright piece carries a brass frame with two pulleys, whose axes are E. and W.: one of these pulleys projects beyond the north side of the principal upright, and from it depends the suspension skein: the other pulley projects on the south side: the suspension skein, being brought from the magnet up to the north pulley, is carried over it and over the south pulley, and thence downwards to a small windlass, carried by the lower part of the moveable upright. The height of the two pulleys above the floor is about 11 ft. $3\frac{3}{4}$ in., and the height of the magnet is about 2 ft. 10 in.; the length of the metal carrier which bears the magnet is 1 ft. 3 in.; so that the length of the free suspending skein is about 7 ft. $2\frac{3}{4}$ in.

The magnet was made by Meyerstein, of Göttingen: it is a bar 2 feet long, $1\frac{1}{2}$ inch broad, and about $\frac{1}{4}$ inch thick: it is of hard steel throughout. The magnet-carrier was also made by Meyerstein, but it has since been altered by Simms. The magnet is inserted sideways and fixed by screws in a double square hook which constitutes the lower part of the magnet-carrier. This lower part turns stiffly by a vertical axis with index in a graduated horizontal circle (usually called the torsion-circle) attached to the upper part. The upper part of the magnet-carrier is simply hooked into the skein.

The suspending skein was originally of silk fibre, in the state in which it is first prepared by silk manufacturers for further operations; namely, when seven or more fibres from the cocoon are united by juxtaposition only (without twist) to form a single thread. The skein was strong enough to support perhaps three times the weight of the magnet, &c.

In the summer and autumn of 1864, an attempt was made to suspend the magnet by a steel wire, capable of supporting the weight 15 lbs.; but the torsion force was found to be so large as greatly to diminish the value of the observations; and the skein was finally restored on 1865, January 20. A similar attempt was made for suspension of the lower magnet; the skein, however, was restored on 1865, January 30.

Upon the magnet there slide two brass frames, firmly fixed in their places by means of pinching-screws. One of these contains, between two plane glasses, a cross of delicate cobwebs; the other holds a lens of 13 inches focal length and nearly 2 inches aperture. This combination, therefore, serves as a collimator without a tube: the cross of cobwebs is seen very well with the theodolite-telescope, when the suspension-bar of the magnet is so adjusted as to place the object-glass of the collimator in front of the object-glass of the theodolite, their axes coinciding. The wires are illuminated by a lamp and lens in the night, and by a reflector in the day.

In the original mounting of this magnet the small vibrations were annihilated by a copper oval or "damper," thus constructed: A copper bar, about one inch square, is bent into a long oval form, intended to contain within itself the magnet (the plane of the oval curve being vertical). A lateral bend is made in the upper half of the oval, to avoid interference with the suspension-piece of the magnet. The effect of this damper was, that after every complete or double vibration of the magnet, the amplitude of the oscillation is reduced in the proportion of 5 : 2 nearly.

On mounting the photographic magnetometer in the basement, the damper was removed from its place surrounding the upper magnet, and was adjusted to encircle the photographic magnet. The upper magnet remained unchecked in its vibrations till 1866, January 23, when the lower part of its magnet-carrier was connected with a brass bar which vibrates in water.

OBSERVATIONS RELATING TO THE PERMANENT ADJUSTMENTS OF THE UPPER DECLINATION-MAGNET AND ITS THEODOLITE.

1. Determination of the inequality of the pivots of the theodolite-telescope.

1862, December 26. The theodolite was clamped, so that the transit-axis was at right angles to the astronomical meridian. The illuminated end of the axis of the telescope was first placed to the East: the level was applied, and its scale was read; the level was then reversed, and its scale was again read; it was then again reversed, and again read, and so on successively six times. The illuminated end of the axis was then placed to the West, and the level was applied and read as before. This process was repeated four times, and the result was that, when the level indicates the axis to be horizontal, the pivot at the illuminated end is really too low by $0''\cdot3$ nearly.

2. Value of one revolution of the micrometer-screw of the theodolite telescope.

On 1862, December 26, observations were made, giving for the value of one revolution of the micrometer 1'. 33"·85. On 1865, December 27, the magnet was made to rest on blocks of wood, and its collimator was used as a fixed mark at an infinite distance. The micrometer of the theodolite was placed in different positions, and the telescope of the theodolite was then turned till the micrometer wire bisected the cross. The result of ten comparisons of theodolite-readings with large values and with small values of the micrometer-reading was, that one revolution = 1'. 34"·8. This is used through the year 1868.

3. Determination of the micrometer-reading for the line of collimation of the theodolite-telescope.

1867, December 26. The vertical axis of the theodolite had been adjusted to verticality, and the transit-axis was made horizontal. The declination-magnet was made to rest on blocks, and the cross-wires carried by it were used as a collimator for determining the line of collimation of the telescope of the theodolite. The telescope was reversed after each observation. The mean of 20 double observations was 100r·077. This value is used throughout the year 1868.

4. Determination of the effect of the mean-time-clock on the declination-magnet.

The observations by which this has been determined are detailed in the volumes for 1840, 1841, 1844, and 1845. It appeared that it was necessary to add 9"·41 to every reading of the theodolite. The clock was removed to the basement in 1864, having now nearly the same relative position to the lower declination-magnet which formerly it had to the upper. No correction is now applied to the upper declination-magnet.

5. Determination of the compound effects of the vertical-force-magnet and the horizontal-force-magnet on the declination-magnet.

The details applying to the effect of the horizontal-force-magnet and first vertical-force-magnet will be found in the volumes for 1840, 1841, 1844, and 1845. It appeared that it was necessary to subtract 55"·22 from all readings of the theodolite. In 1848 a new vertical-force-magnet was introduced, and the subtractive quantity was then found to be 42"·2. A few experiments in 1865 seemed to show that the correction is now 36"·9. No numerical correction has been applied.

6. Determination of the error of collimation for the plane glass in front of the boxes of the declination-magnet.

1867, December 26. The magnet was made to rest entirely on blocks. The micrometer head of the telescope was to the East. The plane glass has the word "top" engraved on it, and, in ordinary use, this word is always kept east. The cross-wire carried by the collimator of the magnet was observed with the engraved word alternately east and west. The result of 20 double observations was, that in the ordinary position of the glass 16"·9 is to be added to all readings.

7. Determination of the error of collimation of the magnet-collimator, with reference to the magnetic axis of the magnet.

1867, December 26. Observations were made by placing the declination-magnet in its stirrup, with its collimator alternately above and below, and observing the collimator-wire by the theodolite-telescope; the windlass of the suspending skein being so moved that the collimator in each observation was in the line of the theodolite-telescope. Seven pairs of observations were taken. The mean half excess of reading with collimator above, (its usual position) over that with collimator below was 25′. 12″·5. The value used in the reductions for 1868 is 25′. 16″·9 (the mean of the results of the four years 1865–1868.

8. Effect of the damper.

In the volume for 1841 observations are exhibited shewing that the oval copper bar, or damper, which then surrounded what is now the upper declination-magnet, had but little or no effect. Repeated observations, of less formal character, in succeeding years, have confirmed this result. The same bar has encircled the lower declination-magnet since the year 1865. The following observations were made in the year 1865, for ascertaining the effect of the damper on the lower declination-magnet under various circumstances.

On 1865, February 8 and 10, and March 2, the time of vibration of the magnet was observed:—

Mean of times with damper in usual position	$23^s \cdot 888$
Mean of times with damper reversed end for end	$24^s \cdot 508$
Mean of times when damper was removed	$23^s \cdot 153$

These seem to indicate a repulsion of the magnet by the damper, but the magnet came to rest so rapidly that the observations are very uncertain.

On several days from 1865, April 2 to May 12, observations were made for ascertaining the deflexion of the magnet produced by turning the damper through a small angle round a vertical axis, passing through its center.

DAMPER IN USUAL POSITION.

		′ ″
Damper turned through 2°	N. end towards E., increase of western declination	−1. 27
	N. end towards W., „ „ „	+1. 25
Damper turned through 4°	N. end towards E., „ „ „	−2. 16
	N. end towards W., „ „ „	+3. 11
Damper turned through 6°	N. end towards E., „ „ „	−3. 10
	N. end towards W., „ „ „	+2. 55
Damper turned through 8°	N. end towards E., „ „ „	−1. 22
	N. end towards W., „ „ „	+1. 45

DAMPER REVERSED END FOR END.

Damper turned through 2°	N. end towards E., increase of western declination	+0. 12
	N. end towards W., „ „ „	+0. 20
Damper turned through 4°	N. end towards E., „ „ „	0. 0
	N. end towards W., „ „ „	+0. 26
Damper turned through 6°	N. end towards E., „ „ „	+0. 5
	N. end towards W., „ „ „	+0. 5
Damper turned through 8°	N. end towards E., „ „ „	−0. 10
	N. end towards W., „ „ „	+0. 5

The first series shews clearly that the damper in its usual position drags the magnet; the second shews no certain effect. It seems that the damper possesses two kinds of magnetism, one permanent, the other transiently induced, of nearly equal magnitude; their sum being about $\frac{1}{100}$ part of the terrestrial effect for the same deflexion.

From 1865, July 25 to August 9, observations were made to ascertain whether the effect of an external deflecting cause is the same with the damper present and the damper removed. The observation was extremely difficult, as the magnet was perpetually in vibration when the damper was removed. A small magnet on the east side of the N. end of the magnetometer, with its north end pointing towards the East (and therefore diminishing the western declination of the magnetometer), was moved to the distance (about five feet) at which it produced a deviation of 5′ nearly. The apparent western declination was observed, damper present, and damper removed. It appeared to be less with damper present than with damper removed, by 0′. 53″. The separate results are very discordant. If the conclusion has any validity, it tends to shew a repulsive power in the damper, opposite to that found in the preceding experiments. This experiment is regarded as inconclusive.

9. Calculation of the constant used in the reduction of the observations of the upper declination-magnet, the micrometer-head of the theodolite-telescope being East.

		° ′ ″
Micrometer equivalent for reading for line of collimation, 100ʳ·077	−	2. 38. 7·2
Correction for the plane glass in front of the box, in its usual position......	+	16·9
The collimator above the magnet. Correction for error of collimation....	−	25. 16·9
Constant to be used in the reduction of the observations......................	−	3. 3. 7·2

10. Determination of the time of vibration of the upper declination-magnet under the action of terrestrial magnetism.

On 1868, January 22, it was found to be 30ˢ·60; on March 19, 30ˢ·56; on December 30, 30ˢ·50.

11. Fraction expressing the proportion of the torsion-force to the earth's magnetic force.

By the same process which is described in the Magnetical Observations 1847, but with the silk skein now in use, the proportion was found, on 1865, January 31, $\frac{1}{214}$; on February 17, $\frac{1}{227}$; on April 27, $\frac{1}{207}$; and on December 27, $\frac{1}{230}$.

DETERMINATION OF THE READINGS OF THE HORIZONTAL CIRCLE OF THE THEODOLITE CORRESPONDING TO THE ASTRONOMICAL MERIDIAN.

The error of the level is determined by application of the spirit-level at the time of observation: due regard being paid, in the reduction, to the inequality of pivots already found. One division of the level is considered = 1″·0526. The azimuth-reading is then corrected by this quantity;

Correction = Elevation of W. end of axis × tan star's altitude.

The readings of the azimuth circle increase as the instrument is turned from N. to E., S., and W.; from which it follows that the correction must have the same sign as the elevation of the W. end.

The correction for the azimuth of the star observed has been computed independently in every observation, by a peculiar method, of which the principle is fully explained in the volumes for 1840, 1841, 1843, 1844, 1845. The formula and table used are the following :—

Let $A_{\prime\prime}$ = seconds of arc in star's azimuth,

C_s = seconds of time in star's hour-angle,

$a_{\prime\prime}$ = seconds of arc in star's N.P.D. for the day of observation,

$$\text{Then log. } A_{\prime\prime} = \text{log. } C_s + \text{log. } E + \text{log. } (a_{\prime\prime} + F) + \text{log. } \cos \varphi$$

The values of log. E, F, and log. cos φ, are given in the following table :—

TABULATED VALUES of LOG. Cos ϕ, for DIFFERENT VALUES of C_s, and of the QUANTITIES LOG. E and F, for the STARS POLARIS and δ URSÆ MINORIS.

Hour Angle.	Log. Cos ϕ for			
	Polaris.	δ Ursæ Minoris.	Polaris S.P.	δ Ursæ Min. S.P.
m				
1	9·99999	9·99999	9·99999	9·99999
2	999	999	999	999
3	999	999	999	999
4	998	998	998	998
5	996	996	997	997
6	994	994	996	996
7	992	992	994	995
8	990	989	992	993
9	988	986	990	991
10	985	983	988	989
11	981	979	985	987
12	978	975	982	984
13	974	971	979	981
14	970	966	975	978
15	966	961	972	975
16	961	955	968	971
17	956	950	964	968
18	951	944	959	964
19	945	937	955	960
20	939	930	950	956
21	932	923	945	951
22	926	915	939	946
23	919	908	933	941
24	912	900	928	936
25	904	891	922	930
26	896	882	915	925
27	888	873	909	919
28	880	863	902	912
29	871	853	894	906
30	9·99862	9·99843	9·99887	9·99900
Log. E	6·09721	6·13638	−6·03899	−6·00617
F	−186″·79	−944″·71	+181″·57	+886″·86

Observations for determining the readings for the astronomical meridian were made on the following days in 1868:—January 17; February 1, 15, 17, 25; March 6; April 20, 29; May 7, 12, 18, 26, 27; June 3, 13, 29; July 9, 13, 14, 21; August 27; September 1; October 7, 16, 27; November 24; December 10, 23, 29. As a check on the continued steadiness of the theodolite, observations of a fixed mark (a small hole in a plate of metal above the Observatory Library, illuminated by a reflector of sky-light in the day and by a lamp at night,) have been taken about thirty times at nearly equal intervals through the year.

The following is a description of the method of making and reducing the eye-observations of the declination-magnet:—

A fine horizontal wire (as stated above) is fixed in the field of view of the theodolite-telescope, and another fine vertical wire is fixed to a wire-plate, moved right and left by a micrometer screw. On looking into the telescope, the cross of the magnetometer is seen; and during the vibration of the magnet, this cross is seen to pass alternately right and left. The observation is made by turning the micrometer till its wire bisects the image of the magnet-cross at the pre-arranged times, and reading the micrometer. The verniers of the horizontal circle are read.

The mean-time clock is kept very nearly to Greenwich mean time (its error being ascertained each day), and the clock-time for each determination is arranged beforehand. Chronometer M'Cabe 649 has usually been employed for observation.

If the magnet is in a state of disturbance, the first observation is made by the observer applying his eye to the telescope about one minute before the pre-arranged time; he bisects the magnet-cross by the micrometer wire at 45^s, and again at 15^s before that time, also at 15^s and 45^s after that time. The intervals of these four observations are therefore the same as the time of vibration of the magnet, and the mean of all the times is the same as the Greenwich pre-arranged mean time.

The mean of each pair of adjacent readings of the micrometer is taken (giving three means), and the mean of these three is adopted as the result. In practice, this is done by adding the first and fourth readings to the double of the second and third, and dividing the sum by 6.

Till 1866, January 23, the magnet was usually in a state of vibration; but, since the introduction of the water-damper on that day, the number of instances of vibration has been very small. When it is found to be quite free from vibration, two bisections only of the cross are made, one about 15^s before the time recorded, the other about 15^s after that time, 30^s being nearly the time of a single vibration. (The lower magnet, furnished with the copper damper, never exhibits any troublesome vibrations.)

The adopted result is converted into arc, supposing $1^r = 1'. 34''\cdot8$, and the quantity thus deduced is added to the mean of the vernier-readings, from which is subtracted the constant given in article 9 of the permanent adjustments; the difference between this number and the adopted reading for the Astronomical South Meridian is taken;

and thus is deduced the magnetic declination, which is used in determining the zero for the photographic register.

§ 3. *General principle of construction of Photographic self-registering Apparatus for continuous Record of Magnetic and other Indications.*

The general principle adopted for all the photographic instruments is the same. For the register of each indication, a cylinder is provided, whose material is ebonite, and which is very accurately turned in the lathe. The axis of the cylinder is placed parallel to the direction of the change of indication which is to be registered. If there are two indications whose movements are in the same direction, both may be registered on the same cylinder; thus, the Declination and the Horizontal Force, whose indications of changes of the respective elements are both made to travel horizontally, can both be registered upon one cylinder with axis horizontal: the same remark applies to the register of two different galvanic Earth-Currents; the Vertical Force and the reading of the Barometer can both be registered upon one cylinder with axis vertical; and similarly the Dry-Bulb Thermometer and the Wet-Bulb Thermometer.

To the ends of each ebonite cylinder there are fixed circular brass plates, that which is near the clock-work having a diameter somewhat greater than that of the cylinder. In the further fittings there is a little difference between those for vertical and those for horizontal cylinders. Each horizontal cylinder has a pivot fixed in the brass plate at each end; these revolve each upon two antifriction wheels of the fixed frame. The vertical cylinders have no pivots; there is a perforation through the center of the lower or larger brass plate which, when the cylinder is mounted, is fitted upon a vertical spindle projecting upwards from the center of a second horizontal brass plate; this second brass plate sustains the weight of the vertical cylinder and turns horizontally, being supported by three antifriction wheels (each in a vertical plane) carried by the fixed frame.

Uniform rotatory motion is given to the cylinders by the action of clock-work, or rather chronometer-work, regulated by either duplex-escapement or chronometer-escapement. For three of the cylinders, which revolve in 24 hours (or 48 hours for the thermometer-cylinder) the axis is placed in the center of the chronometer, and a fork at the end of the hour hand takes hold of a winch fixed to the plate of the cylinder, or (in the vertical cylinders) to the plate that sustains the cylinder. In the cylinder for galvanic earth-currents only, the connexion is made by toothed wheels. For the horizontal cylinders, the plane of the chronometer work is vertical; for the vertical cylinders, it is horizontal.

Three of the cylinders are $11\frac{1}{2}$ inches high, $14\frac{1}{4}$ inches in circumference; that for the thermometers is 10 inches high, and 19 inches in circumference.

Each cylinder is covered, when in use, by a tube of glass, which is open at one end, and has at the other end a circular plate of ebonite, perforated at its center. The tube is a little larger than the cylinder; its open end is kept in position by a narrow collar of ebonite, and the opposite end by a circular piece of brass fixed to the smaller brass plate at the end of the cylinder.

To prepare the cylinder for register of indications, it is covered with a sheet of photographic paper; the moisture on the paper usually agglutinates its overlapping ends with sufficient firmness; the glass tube is then slipped over it, and the cylinder thus loaded is placed (if horizontal,) with its pivots in bearing upon its two sets of antifriction wheels, or, (if vertical,) with its end-brass-plate upon the rotating brass plate, and its central perforation upon the spindle of that plate; care is taken to ensure connection with the clock-work, and the apparatus is ready for action.

The light, by which the trace of each magnet is made, originates in a lamp, formerly of camphine, but, since 1849, of coal gas, sometimes charged with the vapour of coal-naphtha. Before the flame of the lamp is placed a metallic plate, with a small aperture about $0^{in}\cdot3$ high and $0^{in}\cdot1$ broad, independent of the lamp, and supported (for the magnetometers) by a part of the stone capping of the brick pier which carries the magnet; or (for the earth-current apparatus and thermometers) by the upper platform of the braced frame which carries the rest of the apparatus. The following arrangements are for the purpose of throwing on the photographic paper of the revolving cylinder a spot of light which shall travel in the direction of the cylinder's axis with every motion of either magnetometer, or of either galvanometer, or with the rise or fall of the mercury of the barometer or of either thermometer.

For each of the three magnetometers, a large concave mirror of speculum metal is carried by a part of the magnet-carrier; although it has a small movement of adjustment relative to the magnet-carrier, yet in practice it is very firmly clamped to it, so that the mirror receives all the angular movements of the magnet. The lamp above mentioned is placed slightly out of the direction of the straight line drawn from the center of the concave mirror to the center of the cylinder which carries the photographic paper. By the concave mirror, the light diverging from the aperture is made to converge to a place nearly on the surface of the cylinder of photographic paper. The form of the aperture, however, and the astigmatism caused by the inclined reflexion from the mirror, produce this effect, that the image is somewhat elongated in the vertical direction, and is at the same time slightly curved. To diminish the length there is placed near the cylinder a plano-convex cylindrical lens of glass, with its axis parallel to the axis of the cylinder, and the image is thus reduced to a neat spot of light.

For the registers of galvanic earth-currents, the light, which falls upon a plane mirror carried by each galvanometer, is made to converge to a spot by a system of cylindrical lenses.

For the barometer, the light shines through a small aperture in a plate of mica, which moves with the fluctuations of the quicksilver, and thus forms a spot of light.

For the thermometers, the light shines through the vacant part of the tube, and thus forms a sheet of light.

The spot of light (for the magnets, the earth-currents, and the barometer) or the boundary of the line of light (for the thermometers) moves, with the movements which are to be registered, in the direction of the axis of the cylinder, while the cylinder itself is turned round. Consequently, when the paper is unwrapped from its cylindrical form, there is traced upon it (though not visible till the proper chemical agents have been applied) a curve, of which the abscissa measured in the direction of a line surrounding the cylinder is proportional to the time, while the ordinate measured in the direction parallel to the axis of the cylinder is proportional to the movement which is the subject of measure.

In the instruments for registering the motions of the magnets, the earth-currents, and the barometer, a line of abscissæ is actually traced on the paper, by a lamp giving a spot of light in an invariable position, the effect of which on the revolving paper is to trace a line surrounding the cylinder. For the thermometers this is not necessary, as the thermometer-scales are made to carry and to transfer to the photographic paper sufficient indications of the actual reading of the thermometers.

Every part of the cylinder-apparatus for the declination and horizontal force, except those on which the spots of light fall, is covered with a double case of blackened zinc, having a slit for each moveable spot of light and a hole for the invariable spot; and every part of the path of the photographic light is protected by blackened zinc tubes from the admixture of extraneous light. The cylinder-apparatus for the thermometers is protected in the same manner, except that the whole space including the gas-light is enclosed in a zinc case, blackened internally. The earth-current apparatus is enclosed in a mahogany case, similarly blackened.

In all the instruments, the following method is used for attaching, to the sheet of photographic paper, indications of the time when certain parts of the photographic trace were actually made, and for giving the means of laying down a time-scale applicable to every part of the trace. By means of a small moveable plate, arranged expressly for this purpose, the light which makes the trace can at any moment be completely cut off. An assistant, therefore, occasionally cuts off the light (registering in the proper book the clock-time of doing so), and after a few minutes withdraws the plate (again registering the time). The effect of this is to make a visible interruption in the trace, corresponding to registered times. By drawing lines from these points of interruption parallel to the axis of the cylinder, to meet the photographic line of abscissæ, or an adopted line of abscissæ parallel to it, points are defined upon the line of abscissæ corresponding to registered times. The whole length of the photographic sheet (except where one end, in the cylindrical arrangement, laps over the other) corresponds to the known time of revolution of the cylinder. A scale being prepared beforehand, whose value for the time of revolution corresponds to the circumference of the cylinder, and the scale-reading for the registered time of interruption of light being applied to the foot of the ordinate corresponding to that interruption, the divisions of hours and minutes may be transferred at once from the scale to the line of abscissæ. In practice it is found that the length of the paper is not always the same, and it is necessary, therefore, to use for each instrument several pasteboard scales of different lengths, adapted to various lengths of the photographic sheets.

§ 4. *Lower Declination-Magnet; and Photographic self-registering Apparatus for Continuous Record of Magnetic Declination.*

The lower declination-magnet is made by Simms. It is 2 feet long, $1\frac{1}{2}$ inch broad, $\frac{1}{4}$ inch thick, of hard steel throughout, much harder than the upper declination-magnet.

The magnet-frame consists of an upper piece, whose top is a hook, (to be hooked into the suspension-skein), and which carries a concave mirror used for the photographic record in the manner described above. The lower part of this upper piece turns in a graduated horizontal circle, similar to the torsion circle of the upper magnet, and attached to the lower piece or magnet-carrier proper. The lowest part of the carrier is a double square hook, in which the magnet is inserted and is kept in position by the pressure of three screws.

It has been mentioned in § 1 that a small pier, built upon one of the crossed slates which are laid upon three piers rising from below, carries the suspension-pulleys. The suspension-skein rises to one of these pulleys, passes horizontally over a second pulley about 5 inches south of it, and then descends obliquely to a windlass which is fixed to the stone slab about 2 ft. 3 in. south of the center of the magnet.

The height of the pulley above the floor of the Basement is 10 ft. $4\frac{3}{4}$ in. As the height of the magnet above the floor is 2 ft. $10\frac{1}{2}$ in., and the length of the magnet frame is 1 ft. 3 in., there remains 6 ft. $3\frac{1}{4}$ in. of free suspending skein.

One of the revolving cylinders is used for the photographic record of the Declination-Magnet and the Horizontal Force Magnet. In the preparation of the basement in 1864, as has been stated, the south-eastern re-entering angle was cut away, so that the straight line from the suspending skein of the declination-magnet to the center of the bifilar magnet passes through a clear space, in which the registering apparatus is placed.

The concave mirror of the declination-magnet is 5 inches in diameter, and is above the top of the magnet-box. The distance of the light-aperture from the mirror is about 25·3 inches. The bright spot formed by the reflection of light from the mirror is received on the south side of the cylinder, near its west end.

For the declination-magnet, the values, in minutes and seconds of arc, of movements of the photographic spot in the direction of the ordinate, are thus deduced from a geometrical calculation founded on the measures of different parts of the apparatus. The distance of the cylinder from the concave mirror is about $11^{\text{ft.}}\ 0^{\text{in.}}\cdot 1$, and a movement of 1° of the mirror produces a movement of 2° in the reflected ray. From this it is found that 1° of movement of the mirror is represented by 4·611 inches upon the photographic paper. A small scale of pasteboard is prepared, whose graduations correspond in value to minutes and seconds so calculated. The zero of the ordinate-scale is found in the following manner. The time-scale having been laid down as is already described, and actual observations of the position of the upper declination-magnet having been made with the eye and the telescope, (as has been fully described above), at certain registered times, there is no difficulty (by means of these registered times) in defining the points of the photographic trace which correspond to the observed positions. The pasteboard scale being applied as an ordinate to one of these points, and being slid up and down till the scale reading which represents the reading actually taken by the eye-observation falls on that point, the reading of the scale where it crosses the line of abscissæ is immediately found. This process rests on the assumption that the movements of the upper and lower magnets are exactly similar. The various readings given by different observations, so long as there is no instrumental change, will scarcely differ, and may be combined in groups, and thus an adopted reading for the line of abscissæ may be obtained. From this, with the assistance of the same pasteboard scale, there will be laid down without difficulty a new line, parallel to that line of abscissæ whose ordinate would represent some whole number of degrees, or other convenient quantity.

§ 5. *Horizontal-Force-Magnet and Apparatus for observing it.*

The horizontal-force-magnet, furnished by Meyerstein of Göttingen, is, like the declination-magnet, 2 feet long, 1½ inch broad, and about ¼ inch thick. For its support (as is mentioned above), a brick pier in the eastern arm of the Magnetic Observatory, built on the ground below the basement floor, rises through the floor of the upper room, and carries a slate slab, to the top of which a brass frame is attached, carrying two brass pulleys (with their axes in the same east and west line) in front of the pier, and two (in a similar position) at the back of the pier; these constitute the upper suspension-piece. A small windlass is attached to the back of the pier at a convenient height. The magnet-carrier consists of two parts. The upper part is a horizontal bar, 2½ inches long, whose ends are furnished with verniers for reading the graduations of the torsion-circle (a portion of the lower part, to be mentioned below). On the upper side of this horizontal bar are two small pulleys with axes horizontal and at right angles to the vertical plane passing through the length of the bar: by these pulleys the apparatus is suspended, as will be mentioned. From the lower side of the horizontal bar, a vertical axis projects downwards through the center of the torsion-circle, in which it turns by stiff friction. The lower part of the magnet-carrier consists, first of the torsion-circle, a graduated circle about 3 inches in diameter: next, immediately below the central part of the torsion-circle, is attached (but not firmly fixed) a circular piece of metal from which projects downwards a frame that, by means of three cramps and screws, carries the photographic concave mirror, with the plane of its front under the center of the vertical axis: this circular piece of metal has a radial arm upon which acts a screw carried by the torsion-circle, for giving to the concave mirror small changes of azimuthal position. Thirdly, there is fixed to the torsion-circle, at the back of the mirror-frame but not touching it, a bar projecting downwards, bent horizontally under the mirror-frame and then again bent downwards, carrying the cramps in which the magnet rests; and, still lower, a small plane mirror, to which a fixed telescope is directed for observing by reflexion the graduations of a fixed scale (to be mentioned shortly). Under the two small pulleys mentioned above passes a skein of silk; its two branches rise up and pass over the front pulleys of the suspension-piece, then over its back pulleys, and then descend and pass under a single large pulley, whose axis is attached to a wire that passes down to the windlass. Supported by the two branches of the skein, the magnet swings freely, but the direction that it takes will depend on the angular position of its stirrup with respect to the upper horizontal bar; it is intended that the index should be brought to such a position on the torsion-circle that the two suspending branches should not hang in one plane, but should be so twisted that their torsion-force will maintain the magnet in a direction very nearly E. and W. magnetic (its marked end being W.); in which state an increase of the earth's magnetic force draws the marked end towards the N., till the torsion-force is sufficiently increased to resist it; or a diminution allows the torsion-force to draw it towards the S. The magnet, with its plane mirror, hangs within a double rectangular box (one box completely inclosed within another) covered with gilt paper, similar to that used for the declination-magnet; in its S. side there is one long hole, covered with glass, through which the rays of light from the scale enter to fall on the plane mirror, and the rays reflected by the mirror pass to the fixed telescope. The vertical rod (below the torsion-circle), which carries the magnet-stirrup, passes through a hole in the top of the box. Above the magnet box is the concave mirror above mentioned. The height of the brass pulleys of the suspension-piece above the floor is $11^{ft.}\ 8^{in.}\ 5$; that of the pulleys of the magnet-carrier is $4^{ft.}\ 2^{in.}\ 5$; and that of the center of the plane mirror is about $3^{ft.}\ 1^{in.}$. The distance between the branches of the silk skein, where they pass over the upper pulleys, is $1^{in.}\cdot14$; at the lower part the distance between them is $0^{in.}\cdot80$.

An oval copper bar (exactly similar to that for the declination-magnet), embraces the magnet, for the purpose of diminishing its vibrations.

The scale, which is observed by means of the plane mirror, is in a horizontal position, and is fixed to the South wall of the East arm of the Magnetic Basement. The numbers of the scale increase from East to West, so that when the magnet is inserted in the magnet-cell with its marked end towards the West, increasing readings of the scale (as seen with a fixed telescope directed to the mirror which the magnet carries) denote an increasing horizontal force. A normal from the plane-mirror to the scale meets it at the division 51 nearly; the distance from the center of the plane-mirror to the scale is $7^{ft.}\ 6^{in.}\cdot 8$.

The telescope is fixed on the east side of the brick pier which supports the stone pier of the declination-theodolite in the upper observing room. The angle between the normal to the scale (which usually coincides nearly with the normal to the axis of the magnet) and the axis of the telescope, is about 38°, and the plane of the mirror is therefore inclined to the axis of the magnet about 19°.

OBSERVATIONS RELATING TO THE PERMANENT ADJUSTMENTS OF THE HORIZONTAL-FORCE-MAGNET.

1. Determination of the times of vibration and of the different readings of the scale for different readings of the torsion-circle, and of the reading of the torsion-circle and the time of vibration when the magnet is transverse to the magnetic meridian.

To render the process intelligible, it may be convenient to premise the following explanation.

Suppose that the magnet is suspended in its stirrup which is firmly connected with the small plane mirror, with its marked end in a magnetic westerly direction (not exactly W., but in any westerly direction between N. and S.), and suppose that, by means of the telescope directed towards that mirror, the scale is read, or (which is the same thing) the position of the plane mirror and of the stirrup, and therefore that of the axis of the magnet, are defined. Now let the magnet be taken out of the stirrup and replaced with its marked end easterly. The terrestrial magnetic power will now act, as regards torsion, in the direction opposite to that in which it acted before, and therefore the magnet will not take the same position as before. But by turning the torsion-circle, which changes the amount and direction of the torsion-power produced by the oblique tension of the suspending cords, the magnet may be made to take the same position as at first (which will be proved by the reading of the scale, as viewed in the plane mirror, being the same). The reading of the torsion-circle will be different from what it was. The effect of this operation then is, to give us the difference of torsion-circle-readings for the same position of the magnet-axis with the marked end opposite ways, but it gives no information as to whether the magnet-axis is accurately transverse to the meridian, inasmuch as the same operation can be performed whether the magnet-axis is transverse or not.

But there is another observation which will inform us whether the magnet-axis is or is not accurately transverse. Let the time of vibration be taken in each position of the magnet. Resolve the terrestrial magnetic force acting on the poles of the magnet into two parts, one transverse to the magnet, the other longitudinal. In the two positions of the magnet (marked end westerly and marked end easterly, with axis in the same position), the magnitude of the transversal force is the same, and the changes which the torsion undergoes in a vibration of given extent are the same, and the time of vibration (if there were no other force) would be the same. But there is another force, namely, the longitudinal force; and when the marked end is northerly, this tends from the center of the magnet's length, and when it is southerly it tends towards the center of the magnet's length; and in a vibration of given extent this produces force, in one case increasing that from the torsion and in the other case diminishing it. The times of vibration therefore will be different. There is only one exception to this, which is when the magnet-axis is transverse to the magnetic meridian, in which case the longitudinal force vanishes.

The criterion then of the position truly transverse to the meridian (which position is necessary in order that the indications of our instrument may apply truly to changes of the magnitude of terrestrial magnetic force without regard to changes of direction) is this. Find the readings of the torsion-circle which, with magnet in reversed positions, will give the same readings of the scale as viewed by reflexion in the plane mirror, and will also give the same time of vibration for the magnet. With these readings of the torsion-circle the magnet is transverse to the meridian; and the difference of the readings of the torsion-circle is the difference between the position when terrestrial magnetism acting on the magnet twists it one way, and the position when the same force twists it the opposite way, and is therefore double the angle due to the torsion-force of the suspending lines when they neutralize the force of terrestrial magnetism.

The following table exhibits the elements of one of the determinations made for 1868:—

1867. Day.	The Marked end of the Magnet. West. Torsion-Circle Reading.	West. Scale Reading.	West. Difference of Scale Readings for 1° of Torsion.	West. Mean of the Times of Vibration.	East. Torsion-Circle Reading.	East. Scale Reading.	East. Difference of Scale Readings for 1° of Torsion.	East. Mean of the Times of Vibration.
	°	div.	div.	s	°	div.	div.	s
Dec. 24					222	10·40		20·00
	140	14·75		21·44	223	18·47	8·07	20·14
	141	23·72	8·97	21·38	224	25·49	7·02	20·28
	142	32·38	8·66	21·34	225	33·75	8·26	20·36
	143	40·60	8·22	21·14	226	42·17	8·42	20·44
	144	48·79	8·19	20·92	227	50·16	7·99	20·54
	145	57·02	8·23	20·70	228	57·62	7·46	20·70
	146	64·90	7·88	20·60	229	66·34	8·72	20·94
	147·10	75·02	10·12	20·44	230	75·02	8·68	21·20
	148	82·69	7·67	20·30	231	83·40	8·38	21·30
	149	90·48	7·79	20·16	232	92·50	9·10	21·52

The times of vibration and scale readings were sensibly the same, when the torsion-circle read 145°., marked end West, and 227°. 56′, marked end East, differing 82°. 56′. Half this difference, or 41°. 28′, is the angle of torsion when the magnet is transverse to the meridian.

The mean of several similar determinations gave 41°. 23′·7; and this value was adopted till 1868, March 16.

In the months of January and February, experiments were made for the determination of the temperature coefficient of the Horizontal Force Magnet, and at the beginning of March some alterations were made in the photographic apparatus. On March 17, the torsion experiments were repeated, as shown in the following table:—

1868. Day.	The Marked End of the Magnet.							
	West.				East.			
	Torsion-Circle-Reading.	Scale Reading.	Difference of Scale Readings for 1° of Torsion.	Mean of the Times of Vibration.	Torsion-Circle Reading.	Scale Reading.	Difference of Scale Readings for 1° of Torsion.	Mean of the Times of Vibration.
	°	div.	div.	s	°	div.	div.	s
March 17	143	42·72		21·20	226	41·86		20·50
			7·85				7·57	
	144	50·57		20·92	227	49·43		20·60
			8·22				7·97	
	145	58·79		20·70	228	57·40		20·74
			8·27				8·58	
	146	67·06		20·60	229	65·98		20·90
			8·03				8·02	
	147	75·09		20·48	230	74·00		21·04

The angle of torsion given by these observations is 41°. 34′. Finally, experiments made on December 29 gave for angle of torsion 41°. 35′. The mean of the two latter values, namely 41°. 34′·5, was adopted in the reduction of observations from March 17 to the end of the year.

The reading adopted for the torsion-circle, marked end of magnet west, was 145° through the year.

2. Computation of the angle corresponding to one division of the scale, and of the variation of the horizontal force (in terms of the whole horizontal force) which moves the magnet through a space corresponding to one division of the scale.

It was found by accurate measurements, on 1864, November 3, that the distance from $51^{\text{div.}}$ on the scale to the center of the face of the plane mirror is $7^{\text{ft.}}$ $6^{\text{in.}}$ 84, and that the length of $30^{\text{div.}}$·85 of the scale is exactly 12 inches; consequently the angle at the mirror subtended by one division of the scale is 14′. 43″·25, or, for one division of the scale, the magnet is turned through an arc of 7′. 21″·625.

The variation of horizontal force (in terms of the whole horizontal force) for a disturbance through one division of the scale, is computed by the formula, "Cotan. angle of torsion × value of one division in terms of radius." Using the numbers of the last article, the value is found to be 0·0024290 until March 16, and 0·00241365 from March 17 to the end of the year.

3. Determination of the compound effect of the vertical-force-magnet and the declination-magnet on the horizontal-force-magnet, when suspended with its marked end towards the West.

The details of the experiments, made while the old vertical-force-magnet was in use, will be found in the volumes for 1841, 1842, 1843, 1844, 1845. The effect was to increase the readings by $0^{div.}487$. On mounting a new vertical-force-magnet in 1848, similar experiments were made, and the resulting number was $0^{div.}45$. These quantities are totally unimportant in their influence on the registers of changes of horizontal force. No experiments have been made since the magnets were placed in the basement.

4. Effect of the damper.

In the year 1865, from May 17 to May 25, observations were made for ascertaining the deflection of the magnet produced by turning the damper through a small angle round a vertical axis passing through its center.

DAMPER IN USUAL POSITION.

			div.
Damper turned through 2°	W. end towards S.,	increase of scale-reading	−0·251
	W. end towards N.,	„ „	+0·050
Damper turned through 4°	W. end towards S.,	„ „	−0·34
	W. end towards N.,	„ „	+0·16

DAMPER REVERSED END FOR END.

Damper turned through 2°	W. end towards S.,	increase of scale-reading	−0·15
	W. end towards N.,	„ „	−0·02
Damper turned through 4°	W. end towards S.,	„ „	−0·12
	W. end towards N.,	„ „	+0·08

On 1865, July 25, observations were made to ascertain whether the effect of an external deflecting cause is the same with the damper present and the damper removed. A small magnet was placed with its marked end pointing N. at the distance 4 feet S. of the unmarked end of the horizontal-force-magnet, deflecting the magnet through $1^{div.}$ of the scale, and the scale-readings were observed with the damper in its usual place and the damper away. Three experiments were made, containing twenty-four observations of position. Not the smallest difference of position of the horizontal-force-magnet was produced by the presence or absence of the damper. The observations were very easy, and the result is certain.

No experiments on the damper have been made since 1865.

5. Determination of the correction for the effect of temperature on the horizontal force-magnet.

In the Introduction to the volume of Magnetical and Meteorological Observations for 1847 will be found a detailed account of observations made in the years 1846 and 1847 for determination of this element. The principle adopted was that of observing the deflection which the magnet (to be tried) produces on another magnet; the magnet (to be tried) being carried by the same frame which carries the telescope that is directed to the plane mirror attached to the other magnet, and which also carries the scale that is viewed in these experiments by reflection in that plane mirror. The rotation of the frame was measured by a graduated circle about 23 inches in diameter. The magnet (to be tried) was always on the eastern side of the other magnet. It was enclosed in a copper trough, which was filled with water at different temperatures.

One end of the magnet (to be tried) was directed towards the other magnet. The values found for correction of the results as to horizontal force determined with the magnet at temperature t° in order to reduce them to what they would have been if the temperature of the magnet had been 32°, expressed as multiples of the whole horizontal force, were,*

When the marked end of the magnet (to be tried) was West,

$$0{\cdot}00007137\ (t-32) + 0{\cdot}000000898\ (t-32)^2.$$

When the marked end of the magnet (to be tried) was East,

$$0{\cdot}00009050\ (t-32) + 0{\cdot}000000626\ (t-32)^2.$$

The mean, or

$$0{\cdot}00008093\ (t-32) + 0{\cdot}000000762\ (t-32)^2$$

has been embodied in tables which have been used in the computation of the "Reduction of Magnetic Observations 1848–1857," attached to the Volume of Observations 1859, and in the computation for "Days of Great Magnetic Disturbance 1841–1857," attached to the volume for 1862. The same formula has been employed in the Reduction of Magnetic Observations 1858–1863, published in the volume for 1867.

In the year 1864 observations were made for ascertaining the temperature-coefficient by heating the magnet by hot air. The magnet, whose variation of power in different temperatures was to be determined, was placed in a copper box planted upon the top of a copper gas-stove, whose heat could be regulated by manipulation of a tap, and from which rose a stream of heated air (not the air vitiated by combustion) through a large opening in the bottom of the box. The stove used for this purpose was the same which is now used for warming the Magnetic Basement. It was placed in the Magnetic Office, No. 7, in a position magnetic south of the deflexion-apparatus used in the operation for ascertaining the absolute measure of horizontal magnetic force. The hot air which rose through the opening in the center of the bottom was discharged by adjustable openings near the extreme ends of the top. Three windows were provided for reading three thermometers. The box, and the magnet which it inclosed, were placed in a magnetic E. and W. position. The needle whose deflection exhibited the power of the magnet was that which is employed in the ordinary use of the deflexion-apparatus. The proportion of the power of the magnet (under definite circumstances) to the earth's directive horizontal power was expressed by the tangent of the angle of deviation. Observations were made with temperatures both ascending and descending. The intervals of observation at different temperatures were sufficiently small to permit the assumption that the earth's force had not sensibly changed. The following is an abstract of the principal results :—

* By inadvertence in printing the Introduction 1847, the letter t has been used in two different senses.

Horizontal Force Magnet.

Omitting some days of less perfect series, satisfactory series of observations were made on 1864, February 21, 22, 23, and March 10. The tangents of angle of deflection were as follows :—

13 observations with marked end E 13 „ „ W	at mean temperature	36°·8	Fahrenheit	gave	0·403711
21 „ marked end E 25 „ „ W	„	61·3	„		0·400836
17 „ marked end E 16 „ „ W	„	90·3	„		0·400579

From these it was inferred that the tangent of angle of deflection could be represented by—

$$0{\cdot}404559 \times \left\{1 - 0{\cdot}0004610 \times (t - 32) + 0{\cdot}000005061 \times (t - 32)^2\right\}$$

On comparing the quantity within the bracket (which expresses the law of magnetic power as depending on temperature) with that found in 1847, which, as above stated, is—

$$\left\{1 - 0{\cdot}00008093 \times (t - 32) - 0{\cdot}000000762 \times (t - 32)^2\right\}$$

it will be seen that the difference is great. The second terms differ greatly in magnitude, and the third terms in sign.

Possibly some light may be thrown on the difference by the following remark. The two formulæ give the same values for $t = 32°$ and for $t = 97°{\cdot}3$. And they give equal degrees of change per degree when $t = 65°$. It would seem therefore that the real discordance is in the experimental values for the mean temperatures only, or principally; and that it is probable that there is some error in the hot-air process for the middle temperatures.

I insert here (although not applying to the observations of the present volume) the results of a similar examination of the Old Vertical Force Magnet, which was in use to the end of 1863. Omitting less perfect series, observations made on 1864, February 21 and 24, gave the following values for tangents of angles of deflection :—

7 observations with marked end E 7 „ „ W	at mean temperature	34°·2	Fahrenheit	gave	0·279985
9 „ marked end E 11 „ „ W	„	57·0	„		0·275111
7 „ marked end E 7 „ „ W	„	86·5	„		0·270778

From these it was inferred that the tangent of angle of deflection could be represented by—

$$0{\cdot}280526 \times \left\{1 - 0{\cdot}00088607 \times (t - 32) + 0{\cdot}0000045594 \times (t - 32)^2\right\}$$

The expression found in 1847 for the law of force was—

$$\left\{1 - 0{\cdot}00015816 \times (t - 32) - 0{\cdot}000001172 \times (t - 32)^2\right\}$$

giving a discordance of the same kind as that found for the horizontal force, but still larger. The formulæ agree only when $t = 32°$ and when $t = 159°{\cdot}0$. The discordance cannot be removed by a supposition similar to that made above.

Returning now to the temperature-correction of the Horizontal Force Magnet. The unsatisfactory character of the comparisons just given induced me at the beginning of 1868 to try the method of heating the air of the Magnetic Basement generally (by means of the gas-stove), leaving the magnets in all respects in their ordinary state, and comparing their indications as recorded in the ordinary way, but at different temperatures.* Experiments were at first made at intervals of a few hours in the course of one day, but it was soon found that the magnet did not acquire the proper temperature; moreover, the result was evidently affected by diurnal inequality. After this, an entire day was in each case devoted to the effects of each temperature (high or low, as the case might be). The principal series of observations were made with the horizontal force magnet in its ordinary position, or marked end to the west; but a few were made with the marked end to the east. In some instances, the numbers given are the result each of several observations; but in other instances, the result is that of a single observation, taken when all the apparatus had acquired unusual steadiness. The following are the results:—

RESULTS OF TEMPERATURE EXPERIMENTS UPON THE H.F. MAGNET
MARKED END WEST.

1868. MONTH and DAY. (Civil.)		Temperature.	Scale Reading.	Change of Temperature.	Change of Scale Reading.	Change of Scale Reading reduced to Parts of the whole Horizontal Force.	Change of H.F. corresponding to a change of 1° of Temperature (in Parts of the whole Horizontal Force).
		°	div.	°	div.		
January	3	56·8	60·82	6·3	0·65	0·001579	0·000250
	3	50·5	61·47				
	4	49·5	61·47	6·0	0·12	·000292	·000049
	4	55·5	61·35				
	6	59·3	60·91	10·0	0·71	·001725	·000172
	7	49·3	61·62	7·4	0·57	·001385	·000187
	9	56·7	61·05				
	10	58·9	60·91	7·6	0·80	·001943	·000256
	11	51·3	61·71	8·0	0·53	·001288	·000161
	12	59·3	61·18				

* This method was first used for magnets, so far as I am aware, at the Kew Observatory. It had been used for pendulums by Lieut.-General Sabine and by myself.

RESULTS OF TEMPERATURE EXPERIMENTS UPON THE H.F. MAGNET MARKED END WEST—*continued.*

1868. MONTH and DAY. (Civil.)		Temperature.	Scale Reading.	Change of Temperature.	Change of Scale Reading.	Change of Scale Reading reduced to Parts of the whole Horizontal Force.	Change of H.F. corresponding to a change of 1° of Temperature (in Parts of the whole Horizontal Force).
		°	div.	°	div.		
January	13	59·5	61·26	5·6	0·16	0·000389	0·000070
	14	53·9	61·42				
	14	55·2	61·74	2·7	0·31	·000753	·000279
	16	52·5	62·05	9·0	1·27	·003086	·000343
	17	61·5	60·78	8·0	0·46	·001118	·000143
	18	53·5	61·24	6·1	0·31	·000753	·000123
	19	59·6	60·93				
January	31	60·7	58·63	10·1	0·31	·000753	·000075
February	4	50·6	58·94	9·7	0·88	·002138	·000220
	5	60·3	58·06	9·2	0·80	·001943	·000211
	7	51·1	58·86	8·5	0·82	·001992	·000234
	10	59·6	58·04				
	14	59·7	58·64	9·6	0·82	·001992	·000208
	16	50·1	59·46	9·7	0·49	·001190	·000123
	18	59·8	58·97	11·6	0·48	·001166	·000100
	20	48·2	59·45	10·6	0·43	·001045	·000099
	21	58·8	59·02				
Mean . . .		..	..	..	..	....	0·000174

RESULTS OF TEMPERATURE EXPERIMENTS UPON THE H.F. MAGNET MARKED END EAST.

1868. MONTH and DAY. (Civil.)		Temperature.	Scale Reading.	Change of Temperature.	Change of Scale Reading.	Change of Scale Reading reduced to Parts of the whole Horizontal Force.	Change of H.F. corresponding to a change of 1° of Temperature (in Parts of the whole Horizontal Force).
		°	div.	°	div.		
January	21	60·2	60·73	9·7	1·42	0·003449	0·000355
	22	50·5	59·31				
	24	58·6	62·56	7·3	1·02	·002477	·000339
	24	51·3	61·54	8·0	0·32	·000777	·000097
	27	59·3	61·86	10·3	0·35	·000850	·000083
	29	49·0	61·51	11·9	0·30	·000729	·000061
	31	60·9	61·81				
Mean . . .		..	...	..	..	....	0·000187

These results do not differ greatly from those which are given by application of the formula found in 1847. It is important to observe that they include the entire effects of temperature upon all the various parts of the mounting of the magnet, as well as on the magnet itself; and for this reason I think them deserving of great confidence. Still I have thought it prudent, at present, to omit application of corrections for temperature.

The method of observing with the horizontal-force-magnet is the following:—

A fine vertical wire is fixed in the field of view of the telescope, which is directed to the plane mirror carried by the magnet. On looking into the telescope, the graduations of the fixed scale, mentioned in page *xviii*, are seen; and during the oscillations of the magnet, the divisions of the scale are seen to pass alternately right and left across the wire. The clock-time, for which the position of the magnet is to be determined, is the same as that for the observation of declination. The first observation is made by the observer applying his eye to the telescope 40^s before that time, and, if the magnet is in a state of vibration, he observes the next four extreme points of vibration of the scale, and the mean of these is adopted in the same manner as for the declination-observations; but if it is at rest, then at 10^s before the pre-arranged time, he notes the division of the scale bisected by the wire; and 10^s after the pre-arranged time he notes whether the same division continues bisected, and if it does, that reading is adopted as the result.

The number of instances when the magnet was observed in a state of vibration during the year 1868 is very small.

Outside the double box is suspended a thermometer, which is read at every hour of observation. On every day except Sundays, the readings of the thermometer were taken at 21^h, 22^h, 23^h, 0^h, 1^h, 2^h, 3^h, 6^h, and 9^h. Occasional observations have been taken at other hours. Self-registering maximum and minimum thermometers placed outside the box were read twice every day, but in consequence of the very small diurnal range of temperature, their readings are not printed in the volume.

§ 6. *Photographic self-registering Apparatus for Continuous Record of Magnetic Horizontal Force.*

Referring to the general description of photographic apparatus, the following remarks apply more particularly to that which is attached to the horizontal-force-magnet. A concave mirror of speculum-metal, 4 inches in diameter, is carried by the magnet-carrier. The light of a gas-lamp shines through a small aperture $0^{in.}\cdot 3$ high, and $0^{in.}\cdot 01$ broad (which is supported by the solid base of the brick pier carrying the magnet-support), at the distance of about 21·25 inches from the concave mirror, and is made to converge to a point, on the north surface and near the east end of the same revolving cylinder which receives the light from the concave mirror of the declination-magnet.

A cylindrical lens parallel to the axis of the cylinder receives the somewhat elongated image of the source of light, and converts it into a well-defined spot. The motions of this spot parallel to the axis represent the angular movements of the magnet which are produced by an increase of terrestrial magnetic force overcoming more completely the torsion-force of the bifilar suspension, or by a diminution of terrestrial force yielding to the torsion-force.

As the spot of light from the horizontal-force-mirror falls on the side of the cylinder opposite to that on which the light from the declination-mirror falls, the same time-scale will not apply to both; it is necessary to prepare a time-scale independently for each.

The following is the calculation by which the scale of horizontal force on the photographic sheet is determined. The distance between the surface of the concave mirror and the surface of the cylinder is 134·436 inches; consequently, one degree of angular motion of the magnet, producing two degrees of angular motion of the reflected ray, moves the spot of light through 4·6927 inches. Now, from the beginning of the year to March 16, the variation of horizontal force (in terms of the whole horizontal force) corresponding to one degree of angular motion of the magnet $= \sin 1^\circ \times \text{cotan } 41^\circ.\ 23'\cdot 7 = 0\cdot 019801$ nearly. From these numbers it is immediately found that a movement of the spot of light through 2·3699 inches corresponds to a variation of horizontal force expressed by 0·01 part of the whole horizontal force. With this fundamental number, the graduations of the pasteboard scale for measure of horizontal force, applying until March 16, have been prepared. From March 17 to the end of the year, the adopted value of variation of horizontal force for one degree of angular motion of the magnet is $\sin 1^\circ \times \text{cotan } 41^\circ.\ 34'\cdot 5 = 0\cdot 019676$; and the movement of the spot of light for 0·01 part of the whole horizontal force is 2·385 inches.

§ 7. *Vertical-Force-Magnet, and Apparatus for observing it.*

The vertical-force-magnet in use to 1848 was made by Robinson; that in use from 1848 to 1864, January 20, was by Barrow. The magnet now in use is by Simms. Its length is $1^{\text{ft.}}\ 6^{\text{in.}}$; it is pointed at the ends. After some trials, it was re-magnetized by Mr. Simms on 1864, June 15. Between 1864, August 27, and September 27, a new knife-edge was attached to it, to remedy a defect which, as was afterwards found, arose from a cause that had no relation to the knife-edge. Its supporting frame rests upon a solid pier, built of brick and capped with a thick block of Portland stone, in the western arm of the magnetic basement. Its position is as nearly as possible symmetrical with that of the horizontal-force-magnet in the eastern arm. Upon the stone block is fixed the supporting frame, consisting of two pillars (connected at their bases) on whose tops are the agate planes upon which vibrate the extreme parts of the knife-edge (to be mentioned immediately). The carrier of the magnet is an iron frame, to which is attached, by clamps and pinching screws, a steel knife-edge, about 8 inches long. The steel knife-edge passes through an aperture in the magnet. The axis of the magnet is as nearly as possible transverse to the meridian, its marked end being E. The axis of vibration is as nearly as possible N. and S. To the southern end of the iron frame, and projecting further south than the end of the knife-edge, is fixed a small plane mirror, whose plane makes with the axis of the magnet an angle of $52\frac{3}{4}^{\circ}$ nearly. The fixed telescope (to be mentioned) is directed to this mirror, and by reflexion at the surface of the mirror it views a vertical scale (to be mentioned shortly). The height of this mirror above the floor is about $2^{\text{ft.}}\ 10^{\text{in.}}\cdot 6$. Before the introduction of the photographic methods, the magnet was placed in a perforation of a brass frame midway between its knife-edges. But since the photographic method was introduced, the magnet has been placed excentrically; the distance of its southern face from the nearest end of the southern knife-edge being nearly 2 inches, and a space of $4\frac{1}{2}$ inches in the northern part of the iron frame being left disposable. In this disposable space there is attached to the iron frame by three clips a concave mirror of speculum-metal, with its face at right angles to the length of the magnet; it is used in the photographic system (shortly to be described). Near the north end of the iron frame are fixed in it two screw-stalks, upon which are adjustible screw-weights; one stalk is horizontal, and the movement of its weight affects the position of equilibrium of the magnet (which depends on the equilibrium between the moments of the vertical force of terrestrial magnetism on the one hand and of the magnet's center of gravity on the other hand); the other stalk is vertical, and the movement of its weight affects the delicacy of the balance, and varies the magnitude of its change of position produced by a change in the vertical force of terrestrial magnetism.

The whole is inclosed in a rectangular box. This box is based upon the stone block above mentioned; and in it, in a space separated from the rest by a thin partition, the magnet can vibrate freely in the vertical plane. In the south side of the box is a hole covered by glass, through which pass the rays of light from the scale to the plane mirror, and through which they are reflected from the plane mirror to the telescope. And at the east end is a large hole covered by glass, through which passes the light from the lamp to the concave mirror, and through which it is reflected to the photographic cylinder (to be described hereafter).

The telescope is fixed to the west side of the brick pier which supports the stone pier in the upper room carrying the declination-theodolite. Its position is symmetrical with that of the telescope by which the horizontal-force-magnet is observed; so that a person seated in a convenient position can, by an easy motion of the head left and right, observe the vertical-force and horizontal-force-magnets.

The scale is vertical: it is fixed to the pier which carries the telescope, and is at a very small distance from the object-glass of the telescope. The wire in the field of view of the telescope is horizontal. The telescope being directed towards the mirror, the observer sees in it the divisions of the scale passing upwards and downwards over the fixed wire as the magnet vibrates. The numbers of the scale increase from top to bottom; so that, when the magnet is placed with its marked end towards the East, increasing readings (as seen with the fixed telescope) denote an increasing vertical force.

OBSERVATIONS RELATING TO THE PERMANENT ADJUSTMENTS OF THE VERTICAL-FORCE-MAGNET.

1. Determination of the compound effect of the declination-magnet, the horizontal-force-magnet, and the iron affixed to the electrometer pole, on the vertical-force-magnet.

The experiments applying to the magnets are given in the volumes for 1840–1841 to 1845: and those applying to the electrometer pole in the volume for 1842. It appeared that no sensible disturbance was produced on the magnet formerly in use. No experiments have been made with the new magnet.

2. Determination of the time of vibration of the vertical-force-magnet in the vertical plane.

In the year 1868, vibrations of the vertical-force-magnet were observed on 179 different days, and with readings of various divisions of the scale. The mean time of vibration adopted from January 1 to February 11 was $14^{s}\cdot65$; from February 12 to 17, $16^{s}\cdot12$; and from February 18 to the end of the year $13^{s}\cdot85$.

3. Determination of the time of vibration of the vertical-force-magnet in the horizontal plane.

1868, February 12. The magnet with all its apparatus was suspended from a tripod in Magnetic Office, No. 5, its broad side being in a plane parallel to the horizon; therefore, its moment of inertia was the same as when it is in observation. A telescope, with a wire in its focus, was directed to the reflector carried by the magnet. A scale of numbers was placed on the floor of the room, at right angles to the long axis of the magnet, or parallel to the mirror. The magnet was observed only at times when it was swinging through a small arc. From 800 vibrations, the mean time of one vibration $=16^{s}\cdot225$. This number is used through the year 1868.

4. Computation of the angle through which the magnet moves for a change of one division of the scale; and calculation of the disturbing force producing a movement through one division, in terms of the whole vertical force.

The distance from the scale to the mirror is 186·07 inches, and each division of the scale $=\frac{12}{30\cdot85}$ inches. Hence the angle which one division subtends, as seen from the mirror, is $7'.\ 11''\cdot19$; and therefore the angular movement of the normal to the mirror, corresponding to a change of one division of the scale, is half this quantity, or $3.\ 35''\cdot60$.

But the angular movement of the normal to the mirror is not the same as the angular movement of the magnet; but is less in the proportion of unity to the cosine of the angle which the normal to the mirror makes with the magnet, or in the proportion of unity to the sine of the angle which the plane of the mirror makes with the magnet. This angle has been found to be $52\frac{3}{4}°$; therefore, dividing the result just obtained by sine $52\frac{3}{4}°$, we have, for the angular motion of the magnet corresponding to a change of one division of the scale, $4'.\ 30''\cdot85$.

From this, the value, in terms of the whole vertical force, of the disturbing force, producing a change of one division, is to be computed by the formula, "Value of Division in terms of radius $\times$ cotan dip $\times \frac{T'^2}{T^2}$;" where T' is the time of vibration in the horizontal plane, and T the time of vibration in the vertical plane.

From 1868, January 1 to February 11, T' was assumed $= 16^s\cdot225$, $T = 14^s\cdot65$, dip $= 67°.\ 56'.\ 11''$. From February 12 to 17, $T' = 16^s\cdot225$ $T = 16^s\cdot12$, dip $= 67°.\ 55'.\ 51''$. From February 18 to the end of the year, $T' = 16^s\cdot225$, $T = 13^s\cdot85$, dip $= 67°.\ 56'.\ 32''$. From these numbers, the change of the vertical force, in terms of the whole vertical force, corresponding to one division of the scale, is found $= 0\cdot0006528$ for the first period, $0\cdot0005393$ for the second period, and $0\cdot0007302$ for the third period.

5. Investigation of the temperature-correction of the vertical-force-magnet.

The new vertical-force-magnet was subjected to experiments by inclosing it in a copper box, and warming it by an injection of hot air, and observing the amount of deviation which it produced on the suspended magnet used in the deflexion-apparatus for absolute measure of horizontal force, at the same time and in the same manner as were the horizontal-force-magnet and the old vertical-force-magnet, in the experiments described in pages *xxiii* to *xxv*. Observations made on 1864, February 20, 25, March 3, 9, gave, for the tangents of the angles of deflection,—

16 observations with marked end E 18 „ „ W	at mean temperature	36·6	Fahrenheit,	gave	0·172352
33 „ marked end E 29 „ „ W	„	62·2	„		0·171657
26 „ marked end E 27 „ „ W	„	93·3	„		0·171389

From these it appeared that the angle of deflection might be represented by—

$$0\cdot172522 \times \left\{1 - 0\cdot0002233 \times (t - 32) + 0\cdot000001894 \times (t - 32)^2\right\}$$

The quantity within the brackets (which represents the variation of magnetic power in terms of the whole power of the magnet) shows the same peculiarities as those found for the other magnets; that the third term is large, and has a sign opposite to that of the second term.

The factor of variation for 1° of Fahrenheit, when $t = 62°$, is $-\ 0\cdot0001097$.

After these observations, the new vertical-force-magnet was remagnetized by Mr. Simms, on 1864, June 15.

In the beginning of 1868, observations were made in the method already described for the horizontal-force-magnet, by heating the magnetic basement to different temperatures, and observing the scale-reading in the ordinary way. The results are as follows :—

RESULTS OF TEMPERATURE EXPERIMENTS UPON THE VERTICAL-FORCE-MAGNET.

1868. Month and Day.		Temperature.	Scale Reading.	Change of Temperature.	Change of Scale Reading.	Change of Scale Reading reduced to Parts of the whole Vertical Force.	Change of V.F. corresponding to a change of 1° of Temperature (in Parts of the whole V.F.)
		°	div.	°	div.		
January	3	56·0	56·45				
	4	48·2	46·52	7·8	9·93	0·006482	·000831
	5	59·6	61·49	11·4	14·97	·009772	·000857
January	6	59·6	61·73				
	7	49·0	46·84	10·6	14·89	0·009720	·000917
	10	59·5	61·62	10·5	14·78	·009648	·000919
	11	49·7	48·70	9·8	12·92	·008434	·000861
	12	62·0	64·40	12·3	15·70	·010249	·000833
	13	53·4	53·33	8·6	11·07	·007226	·000840
	14	55·4	55·72	2·0	2·39	·001560	·000780
	16	52·3	50·79	3·1	4·93	·003218	·001038
	17	63·7	66·13	11·4	15·34	·010014	·000878
	18	52·4	53·26	11·3	12·87	·008402	·000743
	20	60·7	62·19	8·3	8·93	·005829	·000702
	22	50·6	47·82	10·1	14·37	·009381	·000929
	23	59·6	59·60	9·0	11·78	·007690	·000854
	25	49·6	46·67	10·0	12·93	·008441	·000844
	26	60·5	60·62	10·9	13·95	·009107	·000836
	29	49·3	44·78	11·2	15·84	·010340	·000923
	31	63·1	64·55	13·8	19·77	·012906	·000935
February	4	51·0	47·11	12·1	17·44	·011385	·000941
	5	62·3	64·02	11·3	16·91	·011039	·000977
	6	50·6	46·43	11·7	17·59	·011483	·000981
	7	53·3	49·10	2·7	2·67	·001743	·000646
	8	50·6	45·55	2·7	3·55	·002317	·000858
	10	62·1	62·76	11·5	17·21	·011235	·000977
February	14	60·6	57·70				
	16	49·0	36·75	11·6	20·95	·011298	·000974
	18	61·9	58·85	12·9	22·10	·011919	·000924
February	18	61·9	58·05				
	20	50·0	41·96	11·9	16·09	·011749	·000987
	21	62·6	56·82	12·6	14·86	·010851	·000861
Mean . .		..	..	..	..	...	0·000880

The coefficient of temperature-correction given by these experiments is enormously greater than any that has been found in any previous experiments. Yet I conceive that there can be no doubt of its accuracy. And it is easy to see that an instrument, subjected to the effects of gravity working differentially on its two ends, is liable to great changes depending on temperature which have no connexion with magnetism. For instance, if the point, at which the magnet is grasped by its carrier, is not absolutely coincident with its center of gravity, a great change of position may be produced by a small change of temperature. There appears to be no way of avoiding these evils but by maintaining almost uniform temperature; a condition which has been almost perfectly preserved in the year 1868.

The method of observing with the vertical-force-magnet is the following:—

A fine horizontal wire is fixed in the field of view of the telescope, which is directed to the small plane mirror carried by the magnet. On looking into the telescope, the graduations of the fixed vertical scale are seen; and during the oscillations of the magnet, the divisions of the scale are seen to pass alternately upwards and downwards across the wire. The clock-time, for which the position of the magnet is to be determined, is the same as that for the other two magnets. The observer applies his eye to the telescope about two vibrations before the arranged time, and if the magnet is in motion he observes its places at four extreme vibrations; and the mean of these is taken as for the horizontal-force-magnet. But if the magnet is at rest, then at one-half time of vibration before the arranged time, and at an equal interval after the arranged time, the division of the scale is noted; if there is a slight difference, the mean is taken.

The number of instances in 1868 in which the magnet was found in a state of vibration is very small.

Outside the box is placed a thermometer, which is read at every hour of observation, and also on every day except Sundays, at the hours 21^h, 22^h, 23^h, 0^h, 1^h, 2^h, 3^h, 6^h, and 9^h. Occasional readings of the thermometer are also taken at other hours.

A maximum and a minimum thermometer have also been read twice daily; but the results are not printed.

§ 8. *Photographic self-registering Apparatus for Continuous Record of Magnetic Vertical Force.*

The concave mirror which is carried by the vertical-force-magnet is 4 inches in diameter; its mounting has been described in the last article. At the distance of about 22 inches from that mirror, and external to the box, is the horizontal aperture, about $0^{in}\cdot3$ in length and $0^{in}\cdot01$ in breadth, carried by the same stone block which carries the supports of the agate planes. The lamp which shines through this aperture is carried by a wooden stand. The light reflected from the mirror passes through a cylindrical lens with its axis vertical, very near to the cylinder carrying the photographic paper, and finally forms a well-defined spot of light on the cylinder of paper, at the distance of 100·18 inches from the mirror. As the movements of the magnet are vertical, the axis of the cylinder is vertical. The cylinder is about $14\frac{1}{4}$ inches in circumference, being of the same dimensions as those used for the declination and horizontal-force magnets, and for the earth-currents. The forms of the exterior and interior cylinders, and the method of mounting the paper, are in all respects the same as for the declination and horizontal-force magnets; but the cylinder is supported by being merely planted upon a circular horizontal plate (its position being defined by fitting a central hole in the metallic cap of the cylinder upon a central pin in the plate), which rests on anti-friction rollers and is turned by watchwork once in twenty-four hours. The trace of the vertical-force-magnet is on the west side of the cylinder.

On the east side, the cylinder receives the trace produced by the barometer (to be described hereafter). A pencil of light from the lamp which is used for the barometer shines through a fixed aperture with a small cylindrical lens, for tracing a photographic base-line upon the cylinder of paper, similar to that for the cylinder of the declination and horizontal-force magnets.

The scale for the ordinates of the photographic curve of the vertical force is thus computed. Remarking that the radius which determines the range of the motion of the spot of light is double the distance 100·18 inches, and is therefore = 200·36 inches, the formula used in the last section, when applied to $\frac{\text{disturbing force}}{\text{whole vertical force}} = 0{\cdot}01$, gives value of division = $200{\cdot}36 \times \text{tan. dip.} \times \left(\frac{T}{T'}\right)^2 \times 0{\cdot}01$. The value of the ordinate of the photographic curve for $\frac{\text{disturbing force}}{\text{whole vertical force}} = 0{\cdot}01$, thus obtained, is, from 1868, January 1 to February 11, = 4·030 inches; from February 12 to 17, = 4·878 inches; from February 18 to the end of the year, = 3·603 inches. With these values, the pasteboard scales, used for measuring the photographic ordinates, have been prepared.

§ 9. *Dipping Needles, and Method of observing the Magnetic Dip.*

The instrument with which all the dips in the year 1868 have been observed, is that which, for distinction, is called Airy's instrument. The following description will probably suffice to convey an idea of its peculiarities :—

The form of the needles, the form of their axes, the form of the agate bearings, and the general arrangement of the relieving apparatus, are precisely the same as those in Robinson's and other needles. But the form of the observing apparatus is greatly modified, in order to secure the following objects :—

I. To obtain a microscopic view of the points of the needles, as in the instruments introduced by Dr. Lloyd and Lieut.-General Sabine.

II. To possess at the same time the means of observing the needles while in a state of vibration.

III. To have the means of observing needles of different lengths.

IV. To give an illumination to the field of view of each microscope, directed from the side opposite to the observer's eye, so that the light may enter past the point of the needle into the object glass of the microscope, forming a black image of the needle-point in a bright field of view.

V. To give facility for observing by day or night.

With these views, the following form is given to the apparatus :—

The needle, and the bodies of the microscopes, are inclosed in a square box. The base of the box, two vertical sides, and the top, are made of gun-metal (carefully selected to insure its freedom from iron); but the sides parallel to the plane of vibration of the needle are of glass. Of the two glass sides, that which is next the observer is firmly fixed; it is hereafter called "the graduated glass-plate." The other glass side can be withdrawn, to open the box, for inserting the needle, &c.

An axis, whose length is perpendicular to the plane of vibration of the needles, and is as nearly as possible in the line of the axis of the needle, supported on two bearings (of which one is cemented in a hole in the graduated glass-plate, the other being upon a horizontal bar near to the agate support of the needle-axis), carries a transverse arm, about 11 inches long, or rather two arms, projecting about $5\frac{1}{2}$ inches on each side of the axis. Each of these projecting arms originally had a long opening, or slot, about 1 inch wide, extending from the neighbourhood of the center-work nearly to the end of the arm. Through this opening the tube of a microscope passed, in a direction parallel to the axis of the needle, and was firmly fixed by a shoulder-bearing on one side of the arm, and a circular nut, working in a thread cut upon the microscope-tube, on the other side of the arm. The microscope could thus be fixed at any distance from the central axis, within the limits of the length of the projecting arm. In 1863, between February 24 and May 11, the slot for a single moveable microscope on each side was changed for three fixed microscopes on each side, adapted in position to the lengths of the needles to be mentioned shortly.

The microscope-tube thus carried is not the entire microscope, but so much as contains the object-glass and the field-glass. Upon the plane side of the field-glass (which is turned towards the object-glass), a series of parallel lines is engraved by etching with fluoric acid. The object-glass is so adjusted that the image of the needle-point is formed upon the plane side of the field-glass; and thus the parallel lines can be used for observing the needle in a state of vibration; and, one of them being adopted as standard, the lines can be used for reference to the graduated circle (to be mentioned). All this requires that there be an eye-glass also for the microscope.

The axis of which we have spoken is continued through the graduated glass-plate, and there it carries another transverse arm parallel to the former, and generally similar to it. In each part of this there was originally a sliding eye-socket carrying the eye-glass. In 1863, at the time mentioned above, the slotted arm and moveable eye-socket were changed for an arm with three sockets and eye-glasses. Thus, reckoning from the observer's eye, there are the following parts :—

(1.) The eye-glass.

(2.) The graduated glass-plate (its graduations, however, not intervening in this part of the glass, the graduated circle being so large as to include all the microscopes).

(3.) The field-glass, on the further surface of which the parallel lines are engraved.

(4.) The object-glass.
(5.) The needle.
(6.) The removeable glass side of the box.
(7.) The illuminating reflector, to be described hereafter.

The optical part of the apparatus being thus described, we may proceed to speak of the graduated circle.

The graduations of the circle (whose diameter is about $9\frac{3}{4}$ inches) are etched on the inner surface of the graduated glass-plate. These divisions (as well as the parallel lines on the field glasses of the microscopes) are beautifully neat and regular, and are, I think, superior to any that I have seen on metal. The same piece of metal, which carries the transverse arms supporting the microscope bodies, carries also two arms with verniers for reading their graduations. These verniers (being adapted to transmitted light) are thin plates of metal, with notches instead of lines. The reading of the verniers is very easy. The portion of the axis which is external to the graduated glass-plate (towards the observer), and which has there, as already stated, two arms for carrying the microscope eye-glasses, has also two arms for carrying the lenses by which the verniers and glass-plate graduations are viewed. These four arms are the radii of a circle, which can be fixed in position by a clamp, attached to the gun-metal casing of the graduated glass-plate, and furnished with the usual slow-motion screw.

The entire system of the two arms carrying the microscope-bodies, the two arms carrying the microscope eye-glasses, the two arms carrying the verniers, and the two arms carrying the reading-glasses for the verniers, is turned rapidly by means of a button on the external side of the graduated glass-plate, or is moved slowly by means of the slow-motion screw just mentioned.

It now remains only to describe the illuminating apparatus. On the outside of the removeable glass plate, there are supports for the axis of a metallic circle turning in a plane parallel to the plane of needle-vibration. This circle has four slotted radii, and in these slots or openings there slide small frames carrying prismatic glass reflectors, each of which can turn on an axis, in the plane of the circle but transverse to the radius. Two of these reflectors are for the purpose of sending light through the verniers, and therefore are fixed in radial distance; the other two were intended for sending light past the ends of the needle through the microscopes, and therefore required adjustment on change of needle and corresponding change of position of microscopes. In 1863 these were changed for fixed reflectors, corresponding to the fixed microscopes. The circle was originally turned by a small winch near the observer's hand; at present, the winch is removed, as its axis was found to be slightly magnetic. At each observation, it is necessary to turn the circle which carries the reflectors; but this is the work of an instant.

The light which illuminates the whole is a gas-burner, in the line of the axis of rotation. Its rays fall upon the glass prisms, and each of these is adjusted, by turning on its axis, to throw the reflected light in the required direction.

The whole of the apparatus, as thus described, is planted upon a horizontal plate admitting of rotation in azimuth: the plate is graduated in azimuth, and verniers are fixed to the gun-metal tripod stand. The gas-pipe is led down the central vertical axis, and there communicates by a rotatory joint with the fixed gas-pipes.

The needles adapted for use with this instrument are—

B_1, a plain needle	each 9 inches long.
B_2, a plain needle	
B_3, a loaded needle with adjustible load	
B_4, a needle whose plane passes through the axis of the needle	
C_1, a plain needle	each 6 inches long.
C_2, a plain needle	
C_3, a loaded needle with adjustible load	
C_4, a needle whose plane passes through the axis of the needle	
D_1, a plain needle	each 3 inches long.
D_2, a plain needle	
D_3, a loaded needle with adjustible load	
D_4, a needle whose plane passes through the axis of the needle	

The needles constantly employed are B_1, C_1, D_1, B_2, C_2, D_2.

In discussing carefully the observations taken with this instrument (as well as with other dip-instruments), great trouble was experienced in determining the zenith-point (or reading of the vertical circle when the points of the needle are in the same vertical). To remedy this, a "zenith-point-needle" was constructed under my instructions by Mr. Simms; and it has since been used as need required. It is a flat bar of brass; with pivots similar to those of the dip-needles; and with three pairs of points corresponding to the three lengths of needles used; loaded at one end so as to take a position perfectly definite with respect to the direction of gravity; observed with the microscopes, and reversed for another observation, exactly as the dip-needles. For each of the different lengths of dip-needles, the zenith-point is determined by observation of that pair of points of the zenith-point-needle whose interval is the same as the length of the dip-needle.

The Dip Instrument and all the needles are examined, at the close of each year and at other times if thought desirable, by Mr. Simms. Needle C_2 was in the hands of Mr. Simms for repair from 1867, December 24, to 1868, March 3.

§ 10. *Observations for the absolute Measure of the Horizontal Force of Terrestrial Magnetism.*

In the spring of 1861, a Unifilar Instrument, similar in all respects (as is understood) to those used in and issued by the Kew Observatory, was procured by the courteous application of Lieut.-General Sabine, from the makers, Messrs. J. T. Gibson and Son; and after having been subjected to the usual examinations, at the Kew

Observatory, for determination of its constants (for which I am indebted to the kindness of Balfour Stewart, Esq.), was mounted at the Royal Observatory. Observations with this instrument commenced on 1861, June 11, and were continued through the year; and, after some slight modifications of its verniers, it is still maintained in use (1868).

The deflected magnet (whose use is merely to ascertain the proportion which the power of the deflecting magnet at a given distance bears to the power of terrestrial magnetism) is 3 inches long, carrying a small plane mirror. The deflecting magnet is 4 inches long; it is a hollow cylinder, carrying in its internal tube a collimator, by means of which its time of vibration is observed in another apparatus. The frame which supports the suspension-piece of the deflected magnet carries also the telescope directed to the magnet-mirror; it rotates round the vertical axis of a horizontal graduated circle whose external diameter is 10 inches. The deflecting magnet is always placed on the E. or W. side of the deflected magnet, with one end towards the deflected magnet. In the reduction of the observations, the precepts contained in the Skeleton Form prepared by the Kew Observatory have received the strictest attention.

The following is the explanation of the method of reduction.

The distance of the centers of the deflected and deflecting magnet being known, it is supposed (from observations made at Kew, of which the details have not reached me) that the magnetism of the deflecting magnet is so altered by induction that the following multipliers ought to be used in computing the Absolute Force:—

At distance	factor is
1·0 foot,	1·00031
1·1	1·00023
1·2	1·00018
1·3	1·00014
1·4	1·00011
1·5	1·00009

The correction of the magnetic power for temperature t_0 of Fahrenheit, reducing all to 35° of Fahrenheit, is

$$0·000131261\,(t_0-35)+0·000000259\,(t_0-35)^2$$

A_1 is $\frac{1}{2}(\text{distance})^3\times$ sine deflection, corrected by the two last-mentioned quantities, for distance 1 foot; A_2 is the similar expression for distance 1·3 foot; A'_2 is $\frac{A_2}{(1·3)^2}$; P is $\frac{A_1-A_2}{A_1-A'_2}$. A mean value of P is adopted from various observations; then $\frac{m}{X}=A_1\times\left(1-\frac{P}{1}\right)$ for smaller distance, or $=A_2\times\left(1-\frac{P}{1·69}\right)$ for larger distance. The mean of these is usually adopted for the true value of $\frac{m}{X}$.

For computing the value of mX from observed vibrations, it is necessary to know K, the moment of inertia of the magnet as mounted. The value of log. π^2K furnished by

Mr. Stewart is 1·66073 at temperature 30° and 1·66109 at temperature 90°. Then, putting T for the time of the magnet's vibration as corrected for induction, temperature, and torsion-force, the value of mX is $= \frac{\pi^2 K}{T^2}$. From the combination of this value of mX with the former value of $\frac{m}{X}$, m and X are immediately found.

It appears, from a comparison of observations given in the Introduction to the *Magnetical and Meteorological Observations*, 1862, that the determinations with the Old Instrument (in use to 1861) ought to be diminished by $\frac{1}{117}$ part, to make them comparable with those of the Kew Unifilar.

The computation of the values of m and X has, to the year 1857, been made in reference to English measure only, using the foot and the grain as the units of length and weight; but, for comparison with foreign observations of the Absolute Intensity of Magnetism, it is desirable that X should be expressed also in reference to Metric measure, in terms of the millimètre and milligramme. If an English foot be supposed equal to α times the millimètre, and a grain be equal to β times the milligramme, then it is seen that, for the reduction of $\frac{m}{X}$ and mX to Metric measure, these must be multiplied by α^3 and $\alpha^2\beta$ respectively. Hence X^2 must be multiplied by $\frac{\beta}{\alpha}$, and X by $\sqrt{\frac{\beta}{\alpha}}$. Assuming that the mètre is equal to 39·37079 inches, and the gramme equal to 15·43249 grains, log. $\sqrt{\frac{\beta}{\alpha}}$ will be found to be $=$ 9·6637805, and the factor for reducing the English values of X to Metric values will be 0·46108 or $\frac{1}{2\cdot1689}$. The values of X in Metric measure thus derived from those in English measure are given in the proper table.

§ 11. *Explanation of the Tables of Reductions of the Magnetic Observations (excluding the days of great Magnetic Disturbance).*

The Indications, on which the reductions of this section and the next are founded, are derived entirely from the measures of the ordinates of the Photographic Curves.

The first step taken was to divide the days of observation into two groups; on one of which the magnetism was generally so tranquil that it appeared proper to use those days for determination of the laws of diurnal inequality; while in the other group the movements of the magnetic instruments were so violent, and the photographic curves traced by them so irregular, that it appeared impossible to employ them, except by the exhibition of every motion of the magnet during the day. A similar division into groups had been made in two Memoirs printed in the Philosophical Transactions. For the year 1868, the following days, eleven in number, were selected by Mr. Glaisher as exhibiting practically the same amount of irregularity which he had considered as defining the class of Days of Great Disturbance in the Memoirs to which I have alluded:—

March 20, 23, April 2, 27, 29, July 10, August 30, September 15, 30, October 22, 24.

On the suggestion of some magnetical friends, who desired the list of days in which every motion was exhibited to be liberally extended, the following days were added:—

February 20, March 30, April 1, 19, June 7, 29, July 14, September 20, 27, October 19, 25, November 19.

The whole number of days thus referred to the next section is twenty-three.

These days being separated, the photographic sheets for the remaining days were thus treated. Through each photographic curve a pencil line was drawn, representing, as well as could be judged, the general form of the curve without its petty irregularities. These pencil curves only were then used; and their ordinates were measured, with the proper pasteboard scales, at every hour. The methods of forming from these the various tables of this section require no special explanation.

The temperature of the Magnetometers was maintained in so great uniformity through each day that no apprehension is entertained of the slightest appreciable error in the diurnal inequalities of horizontal force and vertical force, as a consequence of the omission of temperature-correction. But it was impossible to maintain perfect uniformity of temperature through all the seasons. I have, therefore, exhibited, in the Tables of Mean Force in each month, the mean temperature of the month. It will be borne in mind, therefore, that the numbers exhibited are *not* corrected for temperature, but require the correction corresponding to the printed mean temperatures.

§ 12. *Explanation of the Tables of Indications of Magnetometers on twenty-three days of Great Magnetic Disturbance.*

Telescope-observations of the Magnetometers have usually been made four times every day, except on Sundays, on which days two or three observations only have been taken; but, though these observations are employed in forming the base lines on the photographic sheets, their immediate results are not necessarily given in the Tables.

For each photographic record, a new base-line, representing a convenient reading in round numbers of the element to which it applies, has been drawn on the sheet. Then the Assistant, who is charged with the translation of the curve-ordinates into numbers, remarks the salient points of the curve, or the points which if connected by straight lines would produce a polygon not sensibly differing from the photographic curve; to each of these he applies the pasteboard scale proper for the element under consideration; the base of the pasteboard scale determines the time on the time-scale, and the reading of the pasteboard scale for the point of the photographic curve gives the quantity which is to be added to the value for the new base-line. The ordinate-reading so formed is printed without alteration in the Tables. It is particularly to be remarked that the indications for horizontal force and vertical force are *not corrected for temperature.*

In preceding years, allusion has been made to the occasional dislocations of the curve of Vertical Force. No instance of such dislocation has presented itself in 1868. It is believed that these dislocations were produced by bringing a magnet into the proximity (though not very close) of the magnetometer; and this supposed cause of error has, in late years, been carefully avoided.

§ 13. *Wires and Photographic self-registering Apparatus for continuous Record of Spontaneous Terrestrial Galvanic Currents.*

In order to obtain an exhibition of the spontaneous galvanic currents which in some measure are almost always discoverable in the earth, and which occasionally are very powerful, it was necessary to extend two insulated wires from an earth connexion at the Royal Observatory, in two directions nearly at right angles to each other, to considerable distances, where they would again make connexion with the earth. By the kindness of the Directors of the South Eastern Railway Company, to whom the Royal Observatory has on several occasions been deeply indebted, two connexions were made; one to a station near Dartford, at the direct distance $9\frac{3}{4}$ miles nearly, in azimuth (measured from North, to East, South, West), 102° astronomical or 122° magnetical, the length of the connecting wire being about $15\frac{5}{8}$ miles; the other to a station near Croydon, at the direct distance 8 miles, in azimuth, 209° astronomical, or 229° magnetical, the length of the connecting wire being about $10\frac{1}{2}$ miles. At these two stations connexion was made with earth. The details of the course were as follows. The wires were soldered to a water pipe in the Magnetic Ground at the Royal Observatory. Thence they entered the Magnetic Basement, and passed through the photographic self-registering apparatus (to be shortly described). From it they were led up the electrometer mast to a height exceeding 50 feet, and thence they were swung across the grounds to a chimney above the Octagon Room. They descended thence, and were led to a terminal board in the Astronomical Computing Room, to which an intermediate galvanometer can be attached for eye-observation of the currents. From this point they were led to the "Battery Basement," and, with other wires, passed under the Park to the Greenwich Railway Station, and upon the telegraph poles. One wire branched off at the junction with the North Kent Railway to Dartford, the other at the junction with the Croydon Branch Railway to Croydon. At both places their connexion with earth was made by soldering to waterpipes, as at the Royal Observatory.

These wires remained in the places described till the end of 1867. It had been discovered in experience that a much smaller separation of the extreme points of earth-connexion would suffice, and it was conjectured that advantage might arise from making the two earth-connexions of each wire on opposite sides of the Observatory and nearly equidistant from it, instead of making one earth-connexion of each within the Observatory grounds. In 1868, therefore, the following wire-courses were substituted. One wire is connected with earth, by a copper plate, at the Lady Well station of the Mid-Kent Railway; it is thence led by a circuitous course to the North Kent Junction with the Greenwich Railway, to the Royal Observatory (for communication with the self-registering apparatus), back to the North Kent Junction, then by North Kent Railway and Angerstein Branch to the Angerstein Wharf, where it is connected with earth by a copper plate. The other wire is connected with earth by a copper plate at the North Kent Junction, then passes to the Royal Observatory and back to the Junction, and then along the North Kent Railway to the Morden College end of the Blackheath Tunnel, where it is connected with earth in the same manner. The straight lines connecting the extreme points of the wires cross each other near the middle of their lengths and near the Royal Observatory; the length of the first line is nearly 3 miles, and its azimuth 56° N. to E. (magnetic); that of the second line is nearly $2\frac{1}{2}$ miles, and its azimuth 136°. But, in the circuitous courses above described, the length of the first wire is about $10\frac{3}{8}$ miles, and that of the second $6\frac{1}{4}$ miles. These wires were established and brought into use on 1868, August 20.

The apparatus for receiving the effects of the galvanic currents consists essentially of two magnetic needles (one for each wire), each suspended by a hair so as to vibrate horizontally within a galvanic coil, exactly as in the ordinary speaking telegraph (supposed to be laid horizontally); these coils being respectively in the courses of the two long wires. A current of one kind, in either wire, causes the corresponding needle to turn itself through an angle nearly proportioned to the strength of the current, in one direction; a current of the opposite kind causes it to turn in the opposite direction. These turnings are registered by the following apparatus.

The carrier of each magnet carries also a small plane mirror, which receives all the azimuthal motions of the magnet. The light of a gas-lamp passes through a minute aperture, and shines upon the mirror; the divergent pencil is converted into a convergent pencil by refraction through crossed cylindrical lenses (with axes vertical before the pencil reaches the mirror, and with axes horizontal where the pencil is received from the mirror), which, under the circumstances, were more convenient than spherical lenses. A spot of light is thus formed upon the photographic paper wrapped upon a cylinder of ebonite, which is covered by a glass cylinder, and made to rotate in twenty-four hours by clock-work, exactly as for the register of the magnetic elements. As in the case of declination and horizontal-force, the two earth currents make their registers upon opposite sides of the same barrel, and upon different parts of the sheet; the same gaslight serving for the illumination of both.

A portion of a base-line for either record is obtained at any time by simply breaking the galvanic communication.

The photograph records were regularly made, with the wires in the first position, from 1865, March 15, to the end of 1867. Fifty-three days, on which the magnetic disturbances were active, were selected for special examination; and for these the equivalent galvanic currents in the north and west directions were computed, and their effects in producing apparent magnetic disturbances in the west and north directions were inferred. They correspond almost exactly with those indicated by the magnetometers. Then the records for all the days of tranquil magnetism were reduced in the same manner, not for comparison with the magnetometer-results, but for ascertaining the diurnal laws of the galvanic currents. These laws were found to be very different from the laws of magnetic diurnal inequalities. These discussions have been communicated to the Royal Society in two papers, of which the first is printed in the Philosophical Transactions, 1868.

The records with the wires in the new positions have been regularly made since 1868, August 20, but have not yet been discussed.

§ 14. *Standard Barometer.*

The Barometer is a standard, by Newman, mounted in 1840. It is fixed on the South wall of the West arm of the Magnetic Observatory. The graduated scale which measures the height of the mercury is made of brass, and to it is affixed a brass rod, passing down the inside of one of the upright supports, and terminating in a conical point of ivory; this point in observation is made just to touch the surface of the mercury in the cistern, and the contact is easily seen by the reflected and the actual point appearing *just* to meet each other. The rod and scale are made to slide up and down by means of a slow-motion screw. The scale is divided to $0^{in.}05$.

The vernier subdivides the scale divisions to $0^{in.}002$; it is moved by a slow-motion screw, and in observation is adjusted so that the ray of light, passing under the back and front of the semi-cylindrical plate carried by the vernier, is a tangent to the highest part of the convex surface of the mercury in the tube.

The tube is $0^{in.}565$ in diameter; the correction for the effect of capillary attraction is therefore only $+ 0^{in.}002$. The cistern is of glass.

At the bottom of the instrument are three screws, turning in the fixed part of the support, and acting on the piece in which the lower pivot of the barometer-frame turns, for adjustment to verticality: this adjustment is examined weekly.

The readings of this barometer, until 1866, August 20^d, 0^h, are considered to be coincident with those of the Royal Society's flint-glass standard barometer. On that day a change was made in the barometer. It had been remarked that the slow-motion-screw at the bottom of the sliding rod (for adjusting the ivory point to the surface of the mercury in the cistern) was partly worn away: and on August 20 the sliding rod was removed from the barometer by Mr. Zambra to remedy this defect. It was restored on 1866, August 30^d, 3^h. Before the removal of the sliding rod, barometric comparisons had been made with a standard barometer the property of Messrs. Murray and Heath, and with two barometers, Negretti and Zambra, Nos. 646 and 647. While the sliding rod of the Greenwich standard was removed, Negretti and Zambra 647 was used for daily observations. After the new equipment of the standard barometer, another series of comparisons with the same barometers was made: from which it was found (the three auxiliaries giving accordant results) that the readings of the barometer, in its new state, required a correction of $-0^{in}\cdot006$. This is applied in the printed observations commencing with 1866, August 30.

The height of the cistern above the mean level of the sea is 159 feet. This element is founded upon the determination of Mr. Lloyd, in the *Phil. Trans.*, 1831; the elevation of the cistern above the brass piece inserted in a stone in the transit-room (to which Mr. Lloyd refers) being $5^{ft}.2^{in}$.

The barometer has been read at 21^h, 0^h, 3^h, 9^h (astronomical), on every day, excepting on Sundays, and on Good Friday and Christmas Day, on which days fewer observations have been taken. Every reading has been reduced to the reading which would have been obtained at the temperature 32° of the mercury and scale, by application of the correction given in Table II. (pages 82 to 87) of the Report of the Committee of Physics of the Royal Society. The mean of the reduced readings has then been taken for each civil day, and finally converted into mean daily reading, by application of the correction inferred from Mr. Glaisher's paper in the *Philosophical Transactions*, 1848, Part I, Table I, page 127.

In the printed record of the barometrical and all other meteorological observations, the day is to be understood, generally, as defined in civil reckoning.

§ 15. *Photographic self-registering Apparatus for continuous Record of the Readings of the Barometer.*

The Photographic self-registering Apparatus for continuous Record of Magnetic Vertical Force is furnished (as has been stated) with a vertical cylinder covered with photographic paper and revolving in 24 hours. North of the surface of this cylinder, at the distance of about 30 inches, is a large syphon barometer, the bore of the upper and lower extremities of its arms being about 1·1 inch. A glass float partly immersed in the quicksilver of the lower extremity is partially supported by a counterpoise acting on a light lever (which turns on delicate pivots), so that the wire supporting the float is constantly stretched, leaving a definite part of the weight of the float to be supported by the quicksilver. This lever is lengthened to carry a vertical plate of opaque mica with a small aperture, whose distance from the fulcrum is nearly eight times the distance of the point of attachment of the float wire, and whose movement, therefore, is nearly four times the movement of the column of a cistern-barometer. Through this hole the light of a lamp, collected by a cylindrical lens, shines upon the photographic paper.

The scale of time is established by means of occasional interruptions of the light, and the scale of measure is established by comparison with occasional eye-observations.

This barometer was brought into use in 1848, but its indications were not satisfactory till the mercury was boiled in the tube by Messrs. Negretti and Zambra on 1853, August 18, since which time they have appeared unexceptionable. Results of the indications are printed in the *Maxima and Minima of the Barometer*, near the end of the Meteorological Results.

§ 16. *Thermometers for ordinary Observation of the Temperature of the Air and Evaporation.*

The Dry-Bulb Thermometer, the Wet-Bulb Thermometer, the Maximum Self-Registering Thermometers, both dry and wet, and the Minimum Self-Registering Thermometers, dry and wet, all for determination of the temperature of the air and of evaporation, are mounted on a revolving frame whose fixed vertical axis is planted in the ground. From the year 1846 to 1863 the post forming the vertical axis was about 23 feet south (magnetic) of the S.S.E. angle of the south arm of the Magnetic Observatory; in 1863 it was moved to a position about 35 feet south (astronomical) of the south angle. A frame revolves on this post, consisting of a horizontal board as base, of a vertical board projecting upwards from it connected with one edge of the horizontal board, and of two parallel inclined boards (separated about three inches) connected at the top with the vertical board, and at the bottom with the other edge of the horizontal board. The outer inclined board is covered with zinc. The air passes freely between all these boards.

The dry and wet-bulb thermometers are attached to the outside, and near the center of the vertical board; the maximum and minimum thermometers for air towards one vertical edge, and those for evaporation towards the other vertical edge, with their bulbs at almost the same level, and near to those of the dry and wet-bulb thermometers; their bulbs are about 4 feet above the ground and projecting from 2 inches to 3 inches below the horizontal board. Above the thermometers is a small projecting roof to protect them from rain. The frame is always turned with the inclined side towards the sun. It is presumed that the thermometers are thus sufficiently protected.

The graduations of all the thermometers used in the Royal Observatory rest fundamentally upon those of a Standard Thermometer, the property of Mr. Glaisher, which derives its authority from comparison with original thermometers constructed by the late Rev. R. Sheepshanks about the years 1840–1843, in the course of his preparations for the construction of the National Standard of Length. The whole of the radical determinations of Freezing Point, Boiling Point, and Subdivision of Volume of Tube, were made by Mr. Sheepshanks with the utmost care: it is believed that these were the first original thermometers that had been constructed in England for many years. Mr. Glaisher's thermometer has been adopted as the standard of reference for all the thermometers used in the Royal Observatory since 1840.

The Dry-Bulb Thermometer is by Newman. The corrections required for its readings, as found by comparison with the standard above-mentioned, are as follows:—

Between 8° and 11°	subtract	0°·4
12 and 19		0·5
20 and 24		0·6
25 and 30		0·7
31 and 37		0·8
38 and 44		0·9
45 and 52		1·0
53 and 59		1·1
60 and 64		1·2
65 and 68		1·3
69 and 71		1·4
72 and 74		1·5
75 and 77		1·6
78 and 79		1·7
80 and 82		1·8
83 and 84		1·9
85 and 86		2·0
87 and 90		2·1
91 and 95		2·2
96 and 100		2·3
101 and 104		2·4

The wet-bulb thermometer is by Negretti and Zambra, and is in every respect similar to the dry-bulb thermometer. The corrections required to the readings of this thermometer are—

Between 32° and 49°		0°·0
50 and 81	add	0·2
82 and 91		0·0
92 and 105	subtract	0·2

Dry-bulb and wet-bulb thermometers, with pea-bulbs and porcelain scales, Negretti and Zambra 1179, are also mounted on the roof of the library, 4 feet above the leads and 22 feet above the ground. No corrections for index error are applied to the readings of these thermometers.

The eye-readings of the dry-bulb and wet-bulb thermometers have usually been taken at the hours (astronomical reckoning) 21^h, 0^h, 3^h, 9^h, and corrected by application of the numbers given above. They are not printed in the present volume.

The dew-point has been inferred exclusively from the simultaneous observations of the dry-bulb and wet-bulb thermometers, by multiplying the difference between the readings of these thermometers by a factor peculiar to the temperature of the air, and subtracting the product from the reading of the dry-bulb thermometer.

These factors have been found by Mr. Glaisher from the comparison of a great number of dew-point determinations, obtained by use of Daniell's hygrometer, with simultaneous observations of dry-bulb and wet-bulb thermometers. The first part of this investigation was published in full, in the volume of *Magnetical and Meteorological Observations* for 1844, pages 67–72; it was based upon all the observations made up to that time. Subsequently, the comparison was extended to include all the simultaneous observations of these instruments made at the Royal Observatory, Greenwich, from 1841 to 1854, with some observations taken at high temperatures in India, and others at low and medium temperatures at Toronto. The results at the same temperature were found to be the same at these different localities, so far as the climatic circumstances permitted comparison. (See Glaisher's Hygrometrical Tables, 4th Edition). The following table exhibits the result of the entire comparison; it has been used in forming the dew-points in the present volume.

TABLE OF FACTORS by which the DIFFERENCE of READINGS of the DRY-BULB and WET-BULB THERMOMETERS is to be MULTIPLIED in order to PRODUCE the DIFFERENCE between the READINGS of the DRY-BULB and DEW-POINT THERMOMETERS.

Reading of Dry-bulb Thermometer.	Factor.	Reading of Dry-bulb Thermometer.	Factor.	Reading of Dry-bulb Thermometer.	Factor.	Reading of Dry-bulb Thermometer.	Factor.
° 10	8·78	° 33	3·01	° 56	1·94	° 79	1·69
11	8·78	34	2·77	57	1·92	80	1·68
12	8·78	35	2·60	58	1·90	81	1·68
13	8·77	36	2·50	59	1·89	82	1·67
14	8·76	37	2·42	60	1·88	83	1·67
15	8·75	38	2·36	61	1·87	84	1·66
16	8·70	39	2·32	62	1·86	85	1·65
17	8·62	40	2·29	63	1·85	86	1·65
18	8·50	41	2·26	64	1·83	87	1·64
19	8·34	42	2·23	65	1·82	88	1·64
20	8·14	43	2·20	66	1·81	89	1·63
21	7·88	44	2·18	67	1·80	90	1·63
22	7·60	45	2·16	68	1·79	91	1·62
23	7·28	46	2·14	69	1·78	92	1·62
24	6·92	47	2·12	70	1·77	93	1·61
25	6·53	48	2·10	71	1·76	94	1·60
26	6·08	49	2·08	72	1·75	95	1·60
27	5·61	50	2·06	73	1·74	96	1·59
28	5·12	51	2·04	74	1·73	97	1·59
29	4·63	52	2·02	75	1·72	98	1·58
30	4·15	53	2·00	76	1·71	99	1·58
31	3·70	54	1·98	77	1·70	100	1·57
32	3·32	55	1·96	78	1·69		

The maximum self-registering thermometer is a mercurial thermometer, of the construction invented by Messrs. Negretti and Zambra. There is a small detached piece of glass in the tube, just above a bent part of the tube (near the bulb), through which the piece of glass cannot pass down. The column of mercury in rising lifts the glass up and passes freely; but in descending it is unable to pass the glass, and the lower mass of mercury descends, leaving a vacant space below the glass, and leaving a portion of the mercury above it. The piece of glass operates as an efficient valve. The corrections to the readings of this thermometer are as follows:—

Between 32° and 54°	subtract	0°·3
54 and 72		0·2
72 and 80		0·1
80 and 93		0·0
93 and 96	add	0·1
96 and 99		0·2
99 and 102		0·4

There is a similar thermometer for the maximum wet-bulb reading (Negretti and Zambra No. 7537): no corrections have been applied to its readings.

The minimum self-registering thermometers are alcohol thermometers, of the construction known as Rutherford's. A sliding glass index allows the alcohol in rising to pass above it, but is drawn down by the peculiar action of the bounding surface of the fluid when it sinks. The readings of that which gives the minimum temperature of the air require the following corrections, viz.:—

Below 12°	add	0°·2
Between 13 and 18°		0·3
19 and 25		0·4
26 and 35		0·5
36 and 39		0·6
40 and 43		0·7
44 and 47		0·8
48 and 50		0·9
51 and 54		1·0
55 and 57		1·1
58 and 61		1·2
62 and 64		1·3
65 and 67		1·4
68 and 70		1·5
71 and 74		1·6
75 and 77		1·7
78 and 80		1·8

The readings of the minimum wet-bulb thermometer require the following corrections:—

Between 31° and 37°	add	1°·0
37 and 78		0·7

The mean daily values of dry thermometer in the printed columns are found by combining two results derived from different sources. The first and simpler result is the mean of the maximum and minimum, corrected by a small quantity depending on the month, given in Table III. of Mr. Glaisher's paper in the *Philosophical Transactions*, 1848, page 130. The second result is formed by taking the means of the four eye-observations at 21^h, 0^h, 3^h, 9^h, and applying a correction thus investigated. The daily range being found by taking the difference between the maximum and minimum, this daily range is multiplied by the mean of the factors in Table IV. of Mr. Glaisher's paper before mentioned corresponding to the hours of observation; the application of this correction to the mean of the eye-observations gives the second result. (It is evident that this process is applicable to any number of eye-observations.) These two results are then combined to form a mean, weights being given proportional to the number of observations contributing to each result.

For the mean daily value of dew point, the usual process is,—by observing the difference between dry and wet thermometers, and by use of the table of factors printed in page *xlvii* above, to form the difference between air-temperature and dew point at each of the hours of reading; to take the mean of the deduced dew-points; and to apply a correction which is the mean of the corrections in Mr. Glaisher's Table VIII. for the several hours of observation. Sometimes, however, the following process is used. The correction for diurnal range applicable to the mean of the eye-observations of the dry thermometer having been found (as is described above), this correction is multiplied by a fraction, whose numerator is the mean of corrections to wet bulb thermometer in Table VII. for the hours of observations, and whose denominator is the mean of corrections to dry thermometer in Table II. for the same hours; and thus a correction is found which is applied to the mean of the eye-observations of wet bulb thermometer, to form the mean wet bulb for the day. Then by use of the mean dry bulb reading for the day and the mean wet bulb reading for the day and the table of factors above, the mean dew point for the day is formed.

§ 17. *Photographic self-registering Apparatus for continuous Record of the Readings of the Dry-Bulb and Wet-Bulb Thermometers.*

About 28 feet south (magnetic) of the south-east angle of the south arm of the Magnetic Observatory, and about 25 feet east of the thermometers for eye-observations, is a shed 10 ft. 6 in. square, standing upon posts 8 feet high, under which are placed the photographic thermometers, the dry-bulb thermometer towards the east, and the wet-bulb thermometer towards the west. The bulbs of the thermometers are 8 inches in length, and 0·4 inch internal bore, and their centers are about 4 feet above the ground. The bulb of one of the thermometers is covered with muslin throughout its whole length, which is kept moist by means of capillary passage of water along cotton wicks leading to a vessel filled with water.

There are small adjustments admitting the raising or dropping of the thermometers, so that the register of their changing readings may be on a convenient part of the paper. The thermometer frames are covered by plates having longitudinal apertures, so narrow, that any light which may pass through them is completely, or almost completely, intercepted by the broad flat column of mercury in the thermometer-tube. Across these plates a fine wire is placed at every degree; and at the decades of the degrees, and also at 32°, 52°, and 72°, a coarser wire is placed. A gas lamp is placed about 9 inches from each thermometer (east of the dry bulb and west of the wet bulb), and its light, condensed by a cylindrical lens, whose axis is vertical, shines through the thermometer-tube above the surface of the mercury, and forms a well-defined line of light upon the photographic paper, which is wrapped around the cylinder. The axis of this cylinder is vertical; its mounting is in all respects similar to that of the Vertical Force cylinder. As the cylinder, covered with photographic paper, revolves under the light, which passes through the thermometer-tube, it receives a broad sheet of photographic trace, whose breadth (in the direction of the axis of the cylinder) varies with the varying height of the mercury in the thermometer-tube. The light in its passage is intercepted by the wires placed across the tube at every degree, and there are, therefore, left upon the paper corresponding lines in which there is no photogenic action.

The cylinder revolves in 48 hours; the daily photographic traces of the two thermometers are thus simultaneously registered on opposite sides of the cylinder without intermixing. The length of the glass cylinder used in 1868 is 13½ inches, and its circumference is about 19 inches. On 1869, March 5, an ebonite cylinder was introduced, whose length is 10 inches, and circumference about 19 inches; and at a later time the cylinder was made to revolve in 50 hours instead of 48 hours, to insure the separation of the records of the two thermometers.

§ 18. *Thermometers for Solar Radiation and Radiation to the Sky.*

The thermometer for Solar Radiation, which to the end of the year 1864 was placed in an open box about 10 feet south of the south-west angle of the south arm of the Magnetic Observatory, is now laid on the grass, near the same place.

The thermometer is a self-registering maximum mercurial thermometer of Negretti and Zambra's construction; its bulb is blackened, and enclosed in a glass sphere from which the air has been exhausted. Its graduations are correct, and the numbers inserted in the tables are those read from the instrument without alteration. The thermometer is read at 9^h a.m., noon, 3^h p.m., and occasionally at 9^h p.m.; the highest of these readings is adopted as the maximum for the day.

The use of a thermometer with blackened bulb not inclosed in an exhausted sphere was discontinued at the end of 1865.

The thermometer for radiation to the sky is placed near to the Solar Radiation thermometer, with its bulb resting on short grass, and fully exposed to the sky. It is a self-registering minimum spirit thermometer of Rutherford's construction, made by Negretti and Zambra. Its graduation is correct, and the numbers inserted in the table are those read from the scale without alteration. It is read every day at 9^h a.m., and occasionally at 9^h p.m.

This thermometer was out of order on March 8, April 28, May 4, 14, June 14, 25, 26, July 11, October 3.

§ 19. *Thermometers sunk below the Surface of the Soil at different Depths.*

These thermometers were made by Messrs. Adie of Edinburgh, under the immediate superintendence of the late Professor J. D. Forbes. The graduation was made by Professor Forbes himself.

The thermometers are four in number. They are all placed in one hole in the ground, the diameter of which in its upper half is 1 foot, and in its lower half about 6 inches. Each thermometer is attached in its whole length to a slender piece of wood, which is planted in the hole with it. The place of the hole is 20 feet south of the extremity of the south arm of the Magnetic Observatory, and opposite the center of its south front.

The soil consisted of beds of sand; of flint-gravel with a large proportion of sand; and of flints with a small proportion of sand, cemented almost to the consistency of pudding-stone. Every part of the gravel and sand extracted from the hole was perfectly dry.

The bulbs of the thermometers are cylindrical, 10 or 12 inches long and 2 or 3 inches in diameter. The bore of the principal part of the tubes, from the bulb to the graduated scale, is very small. In that part to which the scale is attached, the tube is larger.

The thermometer No. 1 was dropped into the hole to such a depth that the center of its bulb was 24 French feet (25·6 English feet) below the surface: then dry sand was poured in till the hole was filled to nearly half its height. Then No. 2 was dropped in till the center of its bulb was 12 French feet below the surface; No. 3 and No. 4 till the centers of their bulbs were respectively 6 and 3 French feet below the surface; and the hole was then completely filled with dry sand. The upper parts of the tubes, carrying the scales, were left projecting above the surface: No. 1 by 27·5 inches, No. 2 by 28·0 inches, No. 3 by 30·0 inches, and No. 4 by 32·0 inches. Of these lengths, the parts 8·5, 10·0, 11·0, and 14·5 inches, respectively are tube with narrow bore.

The projecting parts of the tubes are protected by a wooden case or box fixed to the ground; the sides of the box are perforated with numerous holes, and it has a double roof. In the North face of this box is a large plate of glass through which the thermometers are read. Within the box are two smaller thermometers, one (No. 5) whose bulb is sunk one inch in the ground, and one (No. 6) whose bulb is in the free air nearly in the center of the box.

The fluid of the four long thermometers is alcohol tinged with a red colour.

The values of 1° on the scales of Nos. 1, 2, 3 and 4, are respectively $2^{\text{in.}}$, $1^{\text{in.}}1$, $0^{\text{in.}}9$, and $0^{\text{in.}}55$; and the ranges of the scales, as first mounted, were, 43°·0 to 52°·7, 42°·0 to 56°·8, 39°·0 to 57°·5, and 34°·2 to 64°·5.

These ranges for Nos. 2, 3, and 4, were found to be insufficient in some years, particularly those of Nos. 3 and 4, or the thermometers sunk to the depth of 6 feet and 3 feet.

In 1857, June 22, Messrs. Negretti and Zambra removed from Nos. 3 and 4 a quantity of fluid corresponding to the extent of 5° on their scales, and the scales of these two thermometers were then lowered by that linear extent, making the readings the same as before. Their ranges are now, respectively, 44° to 62°·5, and 39°·2 to 69°·5.

In subsequent years it was found that the amount of fluid removed was somewhat too great, for now at the lower end of the scale the 6-foot thermometer sometimes falls below the limit of its scale or 44°; and the 3-foot thermometer below 39°·0; in which cases the alcohol sinks into the capillary tube.

The readings at the early part of the series were at times defective at high temperatures, but always complete at low temperatures; now, they are generally complete at high temperatures, and are at times defective at low temperatures. The two combined, however, will enable us to complete all readings.

These thermometers are read once a day, at noon, and the readings appear in the printed volumes as read from their scales without correction.

On 1869, July 21, Mr. Zambra removed fluid from No. 1 to the amount of 2°·7, and from No. 2 to the amount of 1°·5, and inserted in No. 4 fluid to the amount of 1°·5. The scales were re-engraved, to make the reading at every temperature the same as before.

§ 20. *Thermometers immersed in the Water of the Thames.*

The self-registering maximum and minimum thermometers for determining the highest and lowest temperatures of the water of the Thames are by Messrs. Negretti and Zambra, and are observed every day at 9^h a. m.

A strong wooden trunk is firmly fixed to the side of the Dreadnought Hospital Ship, about 5 feet in length, and closed at the bottom; the bottom and the sides, to the height of 3 feet, are perforated with a great number of holes, so that the water can easily flow through; the thermometers are suspended within this trunk so as to be about 2 feet below the surface of the water, and 1 foot from the bottom of the trunk.

The regular observations are made under the superintendence of the Medical Officers of the Ship.

These thermometers were not read on January 1 to 6, March 3, April 26, July 26, September 8, October 6, October 11 to 13. The thermometer for minimum temperature was out of order on November 11 and 12.

The index-error corrections to these thermometers were:—

For the maximum thermometer,	subtract 1°·6
For the minimum thermometer,	subtract 0·6

§ 21. *Osler's Anemometer.*

This anemometer is self-registering: it was made by Newman, on a plan furnished by A. Follett Osler, Esq., F.R.S., but has received several changes since it was originally constructed. A large vane, which is turned by the wind, and from which a vertical spindle proceeds down nearly to the table in the north-western turret of the ancient part of the Observatory, gives motion by a pinion upon the spindle to a rack-work carrying a pencil. This pencil makes a mark upon a paper affixed to a board which is moved uniformly in a direction transverse to the direction of the rack-motion. The movement of the board is effected by means of a second rack connected with the pinion of a clock. The paper has lines printed upon it corresponding to the positions which the pencil must take when the direction of the vane is N., E., S., or W.; and also has transversal lines corresponding to the positions of the pencil at every hour. The first adjustment for azimuth was obtained by observing from a certain point the time of passage of a star behind the vane-shaft, and computing from that observation the azimuth; then on a calm day drawing the vane by a cord to that position, and adjusting the rack, &c., so that the pencil position on the sheet corresponded to that azimuth.

This construction originally arranged by Mr. Osler was in use till the middle of 1866, when the following modifications were made in it by Mr. Browning:—

The vane-shaft was made to bear upon anti-friction-rollers running in a cup of oil. For elucidation of the following description of the apparatus which it carries, I refer to Figure 3 on the engraving at the end of the Introduction to the volume of 1866. To the vane-shaft is attached a rectangular frame C, which rotates with the vane. To this frame are firmly attached the ends of four strong springs D, which rise from the point of attachment in a vertical direction, are then bent so as to descend below the frame C, and are then bent upwards so as to rise a short distance, where they terminate, each of them thus forming a large hook. To the interior of each strong spring, near to its upper bend, is affixed a very weak spring, which descends free into the lower bend or hook of the strong spring, so that its lower end may be moved by a light pressure till it reaches and takes bearing against the bent-up part of the strong spring, after which it cannot be further moved without moving the strong spring, and will therefore require much greater pressure. The four ends of these four light springs carry the circular pressure-plate A by the following connexions. The two which are farthest from A, or which are below the wide part of the vane, are united by a light horizontal cross-bar G; and from the ends of these springs proceed four light bars E, which are attached to points of the pressure-plate A, near its circumference. The two ends of light springs which are nearest to A are also united by a light horizontal cross bar, which is attached to a projection from the center of the plate A. (The diagonal lines upon A, in the diagram, represent indistinctly two strengthening edge-bars upon the pressure-plate, and the projection above-mentioned is fixed to their intersection.) The weight of the pressure-plate thus rests entirely on the slender springs; it is held steadily in position, as regards the opposition to the wind, and it moves without sensible friction. A light wind drives it through a considerable space, until the ends of one pair of light springs touch their large hooks; then for every additional pound of pressure the movement is smaller, till the ends of the other pair of light springs touch their large hooks; after this the movement for every additional pound of pressure is still further diminished. This apparatus was arranged by Mr. Browning. The communication with the pencil below is similar to that in the first construction: the cord and pulley are omitted in the drawing to avoid confusion.

The pressure-pencil below is carried by a radial bar, whose length is parallel to the scale of hours; it is brought to zero by a small weight on a cord running over a pulley.

The surface of the pressure-plate is 2 square feet, or double that in the old construction. The scale of indications on the recording-sheet was determined experimentally as in the old instrument; yet it is remarked that the pressures of wind per square foot appear generally greater than formerly.

The scale for small pressures is much larger, and their indications much more certain than formerly. A pressure of an ounce per square foot is clearly shown.

A rain gauge of peculiar construction is carried by this instrument, by which the fall of rain is registered with reference to the time of the fall. It is described in § 23.

A fresh sheet of paper is applied to this instrument every day at 22^h mean solar time.

§ 22. *Robinson's Anemometer.*

In the latter part of the year 1866, a new instrument, on the principles described by Dr. Robinson in the Transactions of the Royal Irish Academy, vol xxii, adapted to give a continuous record of the velocity of the wind, was mounted by Mr. Browning, of which the principal parts are represented in Figures 1 and 2 of the engraving in the Introduction 1866. The motion is given (as in the former) by the pressure of the air on four hemispherical cups, the distance of the center of each from the axis of rotation being 15·00 inches. The foot of the axis is a hollow flat cone bearing upon a sharp cone which rises up from the base of a cup of oil. The horizontal arms are connected with a vertical spindle, upon which is an endless screw, working in a toothed wheel connected with a train of wheels, furnished with indices capable of registering one mile and decimal multiples of a mile up to 1,000 miles. A pinion C upon the axis of one of the wheels (which, in the figure, occupies a place too high) acts in a rack J, drawing it upwards by the ordinary motion of the revolving cups. The rack is pressed to the pinion by a spring, and, when it has been drawn up, it can be pressed by hand in opposition to the spring so as to release it from the pinion, and can then be pushed down, again to be raised by the action of the wheel-work. The rack is connected at the bottom with a sliding rod D, which passes down into the chamber below, where it draws up the sliding pencil-carrier E. The pencil F, which it carries, traces its indications upon the sheet of paper wrapped round a barrel, whose axis is vertical, and which by spindle connexion with the clock H is made to revolve in 24 hours. The revolving cups and wheel-work are so adjusted that a motion of the pencil upwards of one inch represents a motion of the air through 100 miles. The curve traced upon the barrel exhibits, therefore, the aggregate of the air's movements, and also the air's velocity, at every instant of the day.

In the year 1860, on July 3, 4, and 13, experiments were made in Greenwich Park, with the instrument then in use, to ascertain the correctness of the theory of Robinson's anemometer; the point to be verified being that the scale of the instrument, founded on the supposition that the horizontal motion of the air is about three times the space described by the centers of the cups, is correct.

A post about 5 feet high with a vertical spindle in the top was erected, and on this spindle turned a horizontal arm, carrying at the extremity of its longer portion Robinson's anemometer, and on its shorter portion a counterpoise. The distance from the vertical spindle of the post to the vertical axis of the anemometer was $17^{\text{ft.}}\ 8^{\text{in.}}\cdot7$. The reading of the dial was taken, and then the arm was made to revolve in the horizontal plane 50 or 100 times, an attendant counting the number of revolutions, and the reading of the dial was again taken. In this manner 1,000 revolutions were made in the direction N.E.S.W.N., and 1,000 revolutions in the direction N.W.S.E.N. In some of the experiments the air was sensibly quiet, and in others there was a little wind; the result was,

For a movement of the instrument through one mile,

Beam revolving N.E.S.W. (opposite to the direction of rotation of the Anemometer-cups)	1·15 was registered.
Beam revolving N.W.S.E. (in the same direction as the Anemometer-cups)	0·97 was registered.

The results from rapid revolutions and from slow revolutions were sensibly the same.

This may be considered as confirming in a very high degree the accuracy of the theory.

§ 23. *Rain Gauges.*

The rain-gauge connected with Osler's anemometer is 50 feet 8 inches above the ground, and 205 feet 6 inches above the mean level of the sea. It exposes to the rain an area of 200 square inches (its horizontal dimensions being 10 by 20 inches).

The collected water passes through a tube into a vessel suspended in a frame by spiral springs, which lengthen as the water increases, until 0·24 of an inch is collected in the receiver; it then discharges itself by means of the following modification of the syphon. A copper tube, open at both ends, is fixed in the receiver, in a vertical position, with its end projecting below the bottom. Over the top of this tube a larger tube, closed at the top, is placed loosely. The smaller tube thus forms the longer leg, and the larger tube the shorter leg, of a syphon. The water, having risen to the top of the smaller tube, gradually falls through it into the uppermost portion of a tumbling bucket, fixed in a globe under the receiver. When full, the bucket falls over, throwing the water into a small pipe at the lower part of the globe; the water completely fills the bore of the pipe; its descent causes an imperfect vacuum in the globe, sufficient to cause a draught in the longer leg of the syphon, and the whole contents run off. After leaving the globe, the water is carried away by a waste-pipe attached to the building. The springs then shorten and raise the receiver. The ascent and descent of the water-vessel move a radius-bar which carries a pencil; and this pencil makes a trace upon the paper carried by the sliding board of the self-registering anemometer. As the trace is rather long in proportion to the length of the radius-bar, the bar has now been furnished by Mr. Browning with a "parallel motion," which makes the trace sensibly straight.

The scale of the printed paper was adjusted by repeatedly filling the water-vessel until it emptied itself, then weighing the water, and thus ascertaining its bulk, and dividing this bulk by the area of the surface of the rain receiver.

A second gauge, with an area 77 square inches nearly, is placed close to the preceding, the receiving surface of both being on the same horizontal plane.

A third gauge is placed on the roof of the Octagon room, at 38 feet $4\frac{1}{2}$ inches above the ground, and 193 feet $2\frac{1}{2}$ inches above the mean level of the sea. It is a simple cylinder gauge, 8 inches in diameter and about $50\frac{1}{4}$ inches in area. The height of the cylinder is $13\frac{1}{2}$ inches; at the depth of 1 inch from the top within the cylinder is fixed a funnel (an inverted cone) of 6 inches perpendicular height; with the point of this funnel is connected a tube, $\frac{1}{5}$ of an inch in diameter, and $1\frac{1}{2}$ inch in length; $\frac{3}{4}$ of an inch of this tube is slightly curved, and the remaining $\frac{3}{4}$ of an inch is bent upwards, terminating in an aperture of $\frac{1}{8}$ of an inch in diameter. By this arrangement, the last few drops of water remain in the bent part of the tube, and the water is some days evaporating. The upper part of the funnel or bore of the cone is connected with a brass ring, which has been turned in a lathe, and this is connected with a circular piece 6 inches in depth, which passes outside the cylinder, and rests in a water joint, attached to the inner cylinder, and extending all round.

A fourth gauge is placed on the top of the Library; it is a funnel, whose top has a diameter of 6 inches; its exposed area is $28\frac{1}{4}$ inches nearly. The receiving surface of the gauge is 22 feet 4 inches above the ground, and 177 feet 2 inches above the mean level of the sea.

A fifth gauge is planted on the roof of the Photographic Thermometer shed, 10 feet above the ground, and 164 feet 10 inches above the mean level of the sea. Its construction is the same as that of the third gauge.

A sixth gauge is a self-registering rain-gauge on Crosley's construction, made by Watkins and Hill. The surface exposed to the rain is 100 square inches. The collected water falls into a vibrating bucket, whose receiving concavity is entirely above the center of motion, and which is divided into two equal parts by a partition whose plane passes through the axis of motion. The pipe from the rain-receiver terminates immediately above the axis. Thus that part of the concavity which is highest is always in the position for receiving water from the pipe. When a certain quantity of water has fallen into it, it preponderates, and, falling, discharges its water into a cistern below; then the other part of the concavity receives the rain, and after a time preponderates. Thus the bucket is kept in a state of vibration. To its axis is attached an anchor with pallets, which acts upon a toothed wheel by a process exactly the reverse of that of a clock-escapement. This wheel communicates motion to a train of wheels, each of which carries a hand upon a dial-plate; and thus inches, tenths, and hundredths are registered. Sometimes, when the escapement has obviously failed, the water which has descended to the lower cistern has again been passed through the gauge, in order to enable an assistant to observe the indication of the dial-plates without fear of an imperfection in the machinery escaping notice. The gauge is placed on the ground, 21 feet South of the Magnetic Observatory, and 156 feet 6 inches above the mean level of the sea.

The seventh and eighth gauges are placed near together, about 16 feet south of the Magnetic Observatory, 5 inches above the ground, and 155 feet 3 inches above the mean level of the sea. They are similar in construction and area to No. 3. These cylinders are sunk about 8 inches in the ground.

All these gauges, except No. 7, are read at 22^h daily; in addition, Crosley's gauge and No. 8 are read daily at 9^h p.m., and No. 7 at the end of each month only, to check the summation of the daily readings of No. 8. All are read at midnight of the last day of each month.

At the end of 1868 a leak was found in the gauge No. 7, and its indications for the year have not been used. The instrument was repaired in 1869, January.

Gauges Nos. 1, 2, 3, 5, 8 were made by Messrs. Negretti and Zambra; No. 4 by Troughton; No. 6 by Watkins and Hill; and No. 7 is an old gauge.

§ 24. *Electrical Apparatus.*

The electrical apparatus consists of two parts, namely, the Moveable Apparatus, which is connected with a pole nearly 80 feet high planted 7 feet North and 2 feet East of the north-east angle of the north arm of the Magnetic Observatory (as extended in 1862); and the Fixed Apparatus, which is mounted in a projecting window in the ante-room of the Magnetic Observatory.

On the top of the pole is fixed a projecting cap, to which are fastened the ends of two iron rods, which terminate in a pit sunk in the ground, and are kept in tension by attached weights. These rods are to guide the moveable apparatus in its ascents and descents. Near the bottom of the pole is fixed a windlass; the rope upon which it acts passes over a pulley in the cap, and is used to raise the moveable apparatus, which when raised to the top is suspended on a hook.

The moveable apparatus consists of the following parts:—A plank in a nearly vertical position is attached to perforated iron bars, which slide upon the iron rods. On the upper part of this plank is a cubical box. The box incloses a stout pillar of glass, having a conical hollow in its lower part. In the bottom of the box there is a large hole through which a cone of copper passes into the conical hollow of the glass pillar. In the lower part of the box a gas-lamp is placed, by the flame of which the copper cone and the lower part of the glass pillar are kept in a state of warmth. A copper wire is fastened round the glass pillar; its end is carried to a similar glass pillar, warmed in the same manner, near the north-western turret of the Octagon room; by this wire, whose length is about 400 feet, the atmospheric electricity is collected. To this wire, near the box, is attached another copper wire (now covered with gutta percha) 0·1 inch in diameter, and about 73 feet long, at the end of which is a hook; a loaded brass lever connected with the fixed apparatus presses upon this hook, and thus keeps the wire in a state of tension, and at the same time establishes the electrical communication between the long horizontal wire and the fixed apparatus.

The fixed apparatus consists of these parts:—A glass bar, nearly 3 feet long, and thickest at its middle, is supported in a horizontal position, its ends being fixed in pieces of wood projecting downwards from the roof of the projecting window. Near to each end is placed a small gas-lamp, whose chimney encircles the glass, and whose heat keeps the glass in a state of warmth proper for insulation. A brass collar surrounds the center of the glass bar; it carries one brass rod, projecting vertically upwards through a hole in the roof of the window-recess, to which rod are attached a small metallic umbrella and the loaded lever above-mentioned; and it carries another rod projecting vertically downwards, to which is attached a horizontal brass tube in an East and West direction. On the North and South sides of this tube there project four horizontal rods, through the ends of which there pass vertical rods, which can be fixed by screws at any elevation; these are placed in connexion with the electrometers, which rest on the window seat.

The electrometers during the year 1868 consisted of two Volta's Electrometers, denoted by Nos. 1 and 2; a Henley's Electrometer; a Ronalds' Spark Measurer; a Dry-pile Apparatus; and a Galvanometer.

Volta 1 and Volta 2 are of the same construction; each is furnished with a pair of straws 2 Paris inches in length; those of the latter being much heavier than those of the former: each instrument is furnished with a graduated ivory scale, whose radius is 2 Paris inches, and it is graduated into half Paris lines. In the original construction of these instruments it was intended that each division of No. 2 should correspond to five of No. 1: the actual relation between them has not yet been determined by observations at the Royal Observatory. The straws are suspended by hooks of fine copper wire to the suspension-piece, and they are separated by an interval of half a line.

Henley's Electrometer is supported on the West end of the large horizontal tube by means of a vertical rod fixed in it. On each side of the upper part of this rod is affixed a semicircular plate of ivory, whose circumference is graduated; at the centers of these ivory plates two pieces of brass are fixed, which are drilled to receive fine steel pivots, carrying a brass axis, into which the index or pendulum is inserted; the pendulum terminates with a pith ball. The relation between the graduations of this instrument and those of the other electrometers has not been determined. This instrument has seldom been affected till Volta 2 has risen to above 100 divisions of its scale.

The spark measurer consists of a vertical sliding rod terminated by a brass ball, which ball can be brought into contact with one of the vertical rods before referred to, also terminating in a ball; and it can be moved from it or towards it by means of a lever, with a wooden handle. During the operation of separating the balls, an index runs along a graduated scale, and exhibits the distance between the balls, and this distance measures the length of the spark.

The electrometers and the spark measurer were originally constructed under the superintendence of Francis Ronalds, Esq., but have since received small alterations.

The dry-pile apparatus was made by Watkins and Hill; it is placed in connexion with the brass bar by a system of wires and brass rods. The indicator, which vibrates between the two poles, is a small piece of gold leaf. This instrument is very delicate, and it indicates at once the quality of the electricity. When the inclination of the gold leaf is such that it is directed towards the top of either pile, it remains there as long as the quantity of electricity continues the same or becomes greater: the position is sometimes expressed in the notes by the words "as far as possible." The angle which the gold leaf makes with the vertical at this time is about 40°.

The galvanometer was made by Gourjon of Paris, and consists of an astatic needle, composed of two large sewing needles, suspended by a split silk fibre, one of the needles of the pair vibrating within a ring formed by 2,400 coils of fine copper wire. The connexions of the two portions of wire forming these 2,400 coils are so arranged that it is possible to use a single system of 1,200 coils of single wire, or a system of 1,200 coils of double wire, or a system of 2,400 coils of single wire: in practice the last has always been used. A small ball communicating by a wire with one end of the coils is placed in contact at pleasure with the electric conductor, and a wire leading from the other end of the coil communicates with the earth. An adjustable circular card, graduated to degrees, is placed immediately below the upper needle; the numeration of its divisions proceeds in both directions from a zero. One of these directions is distinguished by the letter A, and the other by the letter B; and the nature of the indication represented by the deflection of the needle towards A or towards B will be ascertained from the following experiment. A voltaic battery being formed by means

h 2

of a silver coin and a copper coin, having a piece of blotting paper moistened with saliva between them: when the copper touches the small ball, and the wire which usually communicates with the earth is made to touch the silver, the needle turns towards A; when the silver touches the small ball, and the wire is made to touch the copper, the needle turns towards B.

§ 25. *Explanation of the Tables of Meteorological Observations.*

The mean daily value of the difference between dew-point temperature and air-temperature is the difference between the two numbers in the sixth and seventh columns. The Greatest and Least are the greatest and least among the differences corresponding to the times of observation in the civil day, or they are found from the absolute maxima and minima, as determined by comparing the observations of the self-registering wet-bulb thermometers with those of the self-registering dry-bulb thermometers.

The difference between the mean temperature for the day and the mean for the same day of the year on an average of fifty years, is found by comparison with a table of results deduced by Mr. Glaisher from fifty years' observations, made at the Royal Observatory, ending 1863.

Little explanation of the results deduced from Osler's Anemometer appears to be necessary. It may be understood generally that the greatest pressure occurred in gusts of short duration.

To 1867, October 31, the indication of Robinson's Anemometer was read off every day at 22^h (10^h A.M.), and the difference between consecutive readings was entered opposite to the civil day on which the first reading was taken. From 1867, November 1, and through 1868, the daily values have been extracted from the sheets of the continuous record, applying to the interval from midnight to midnight, and are entered opposite to the civil day to which each value belongs.

The daily register of rain is given for each civil day ending at midnight. This applies to the Cylinder Rain-gauge partly sunk in the ground, described above as the "eighth."

For understanding the divisions of time under the heads of Electricity and Weather, the following remarks are necessary:—The day is divided by columns into two parts (from midnight to noon, and from noon to midnight), and each of these parts is roughly subdivided into two or three parts by colons (:). Thus, when there is a single colon in the first column, it denotes that the remarks before it apply (roughly) to the interval from midnight to 6 A.M., and those following it to the interval from 6 A.M. to noon. When there are two colons in the first column, it is to be understood that the twelve hours are divided into three nearly equal parts of four hours each. And similarly for the second column.

The following is the explanation of the notation employed for record of electrical observations, it being premised that the quality of the Electricity is always to be supposed positive when no indication of quality is given:—

g cur.	denotes *galvanic currents*	s	denotes *strong*
m	... *moderate*	sp	... *sparks*
N	... *negative*	v	... *variable*
P	... *positive*	w	... *weak*

The duplication of the letter denotes an intensity of the modification described, thus, s s is very strong; v v, very variable.

The Clouds and Weather are described generally by Howard's Nomenclature; the figure denotes the proportion of sky covered by clouds, the whole sky being represented by 10. The notation is as follows:

a	denotes *aurora borealis*	n	denotes *nimbus*
ci	... *cirrus*	r	... *rain*
ci-cu	... *cirro-cumulus*	th-r	... *thin rain*
ci-s	... *cirro-stratus*	oc-r	... *occasional rain*
cu	... *cumulus*	oc-th-r	... *occasional thin rain*
cu-s	... *cumulo-stratus*	fr-r	... *frozen rain*
d	... *dew*	h-r	... *heavy rain*
h-d	... *heavy dew*	shs-r	... *showers of rain*
f	... *fog*	c-r	... *continued rain*
sl-f	... *slight fog*	c-h-r	... *continued heavy rain*
th-f	... *thick fog*	m-r	... *misty rain*
fr	... *frost*	fr-m-r	... *frequent misty rain*
g	... *gale*	oc-m-r	... *occasional misty rain*
h-g	... *heavy gale*	sl-r	... *slight rain*
glm	... *gloom*	h-shs	... *heavy showers*
gt-glm	.. *great gloom*	fr-shs	... *frequent showers*
h-fr	... *hoar frost*	fr-h-shs	... *frequent heavy showers*
h	... *haze*	li-shs	... *light showers*
hl	... *hail*	oc-shs	... *occasional showers*
so-ha	... *solar halo*	oc-h-shs	... *occasional heavy showers*
l	... *lightning*	sq	... *squall*
li-cl	... *light clouds*	sqs	... *squalls*
lu-co	... *lunar corona*	fr-sqs	... *frequent squalls*
lu-ha	... *lunar halo*	h-sqs	... *heavy squalls*
m	... *meteor*	fr-h-sqs	... *frequent heavy squalls*
ms	... *meteors*	oc-sqs	... *occasional squalls*
mt	... *mist*	sc	... *scud*

li-sc denotes	*light scud*	t-s denotes	*thunder storm*
sl ...	*sleet*	th-cl ...	*thin clouds*
sn ...	*snow*	v ...	*variable*
oc-sn ...	*occasional snow*	vv ...	*very variable*
sl-sn ...	*slight snow*	w ...	*wind*
s ...	*stratus*	st-w ...	*strong wind*
t ...	*thunder*		

The foot-notes show the means and extremes of readings, and their departure in each month from average values, as found from the preceding Twenty-seven Years' Observations; those relating to Humidity have been calculated from the Fourth Edition of Glaisher's Hygrometrical Tables.

§ 26. *Observations of Luminous Meteors.*

In arranging for the observations of meteors, the directions circulated by the Committee of the British Association have received the most careful attention. The observers have been educated in the knowledge of the principal stars by observations of the stars themselves, and by means of globes and maps. The general instruction to all observers has been, to look out for meteors on every clear night; but the observer specially appointed for the evening's duties has been more particularly charged with this observation.

On the nights specially mentioned in the directions of the British Association Committee, greater attention was given to the sky, and the observations of meteors were made more systematically. The principal nights are, January 2 and 10; February 6; March 1; April 19; May 18; June 6 and 20; July 17, 20, and 29; August 3, August 7–13; September 10; October 1 and 23; November 9–14, November 19, 28, and 30; December 8–14, especially December 11. A more extended list of days has been published by the British Association Committee.

Special arrangements were made in the August period for observing till the morning; and in the November period for observing through the night, one or two observers being on duty till midnight, and then all the observers till daybreak. The observers were so stationed as to command different views of the sky, to secure observation of all the meteors which might present themselves, and to guard against the observation of the same meteor by different observers.

The observers in the year 1868 were Mr. Nash, Mr. Trapaud, Mr. Wright, Mr. Farncomb, and Mr. Schultz. Their observations are distinguished by the initials N., T., W., F., and S., respectively.

§ 27. *Details of the Chemical Operations for the Photographic Records.*

Mr. Glaisher has drawn up the following account of the Chemical Processes employed in the Photographic Operations for the self-registration of the Magnetical and Meteorological Indications.

CHEMICAL PREPARATION AND TREATMENT OF THE PHOTOGRAPHIC PAPER FOR PRIMARIES.

The paper used is similar to that made by Whatman; it is made by his successor Hollingsworth; it is strong and of even texture, and is prepared expressly for Photographic purposes.

First Operation.—Preliminary Preparation of the Paper.

The chemical solutions used in this process are the following:—

(1.) Sixteen grains of Iodide of Potassium are dissolved in one ounce of distilled water.

(2.) Twenty-four grains of Bromide of Potassium are dissolved in one ounce of distilled water.

(3.) When the crystals are dissolved, the two solutions are mixed together, forming the iodising solution. The mixture will keep through any length of time. Immediately before use, it is filtered through filtering paper.

A quantity of the paper, sufficient for the consumption of several weeks, is treated in the following manner, sheet after sheet.

> The sheet of paper is pinned by its four corners to a horizontal board. Upon the paper, a sufficient quantity (about 50 minims, or $\frac{5}{48}$ of an ounce troy) of the iodising solution is applied, by pouring it upon the paper in front of a glass rod, which is then moved to and fro till the whole surface is uniformly wetted by the solution. Or, the solution may be evenly distributed by means of a camel-hair brush.

The paper thus prepared is allowed to remain in a horizontal position for a few minutes, and is then hung up to dry in the air; when dry, it is placed in a drawer, and may be kept through any length of time.

Second Operation.—Rendering the Paper sensitive to the Action of Light.

A solution of Nitrate of Silver is prepared by dissolving 50 grains of crystallized Nitrate of Silver in one ounce of distilled water. Since the magnetic basement has been used for photography, 15 grains of Acetic Acid have always been added to the solution.

Then the following operation is performed in a room illuminated by yellow light.

> The paper is pinned as before upon a board somewhat smaller than itself, and (by means of a glass rod, as before,) its surface is wetted with 50 minims of the Nitrate of Silver solution. It is allowed to remain a short time in a horizontal position, and, if any part of the paper still shines from the presence of a part of the solution unabsorbed into its texture, the superfluous fluid is taken off by the application of blotting paper.

The paper, still damp, is immediately placed upon the interior cylinder, and is covered by the exterior glass cylinder, and the united cylinders are mounted upon the revolving apparatus, to receive the spot of light formed by the mirror, which is carried by the magnet; or to receive the line of light passing through the thermometer tube.

Third Operation.—Development of the Photographic Trace.

When the paper is removed from the cylinder, it is placed as before upon a board, and a saturated solution of Gallic Acid, to which a few drops of Aceto-Nitrate of Silver are occasionally added, is spread over the paper by means of a glass rod, and this action is continued until the trace is fully developed. The solutions are kept in the magnetic basement, and are always used at the temperature of that room. When the trace is well developed, the paper is placed in a vessel with water, and repeatedly washed with several waters; a brush being passed lightly over both sides of the paper to remove any crystalline deposit.

Fourth Operation.—Fixing the Photographic Trace.

The Photograph is placed in a solution of Hyposulphite of Soda, made by dissolving four or five ounces of the Hyposulphite in a pint of water; it is plunged completely in the liquid, and allowed to remain from one to two hours, until the yellow tint of the Iodide of Silver is removed. After this the sheet is washed repeatedly with water, allowed to remain immersed in water for 24 hours, and afterwards placed within folds of cotton cloths till nearly dry. Finally it is placed between sheets of blotting-paper, and is pressed.

CHEMICAL PREPARATION AND TREATMENT OF THE PHOTOGRAPHIC PAPER FOR SECONDARIES.

Before taking a Secondary, the Primary is examined to ascertain whether the tint of the photographic curve is sufficiently dark. If it is not, the Primary is laid, face downwards, upon a desk of transparent plate-glass, below which is a large silvered plane mirror, so placed that the light from the sky is reflected upwards through the transparent glass and through the Primary; and the photographic curve is seen from the upper side or back with perfect distinctness. An assistant then darkens the back of the photographic curve by the application of sepia; the original photograph being untouched.

The paper used for the Secondaries is made by Rive; it is a strong wove paper, of tolerably even texture, thin, but able to bear a great deal of wear.

First Operation.—Preliminary Preparation of the Paper.

The chemical solution required for this purpose is as follows:—

Two grains of Chloride of Ammonium are dissolved in one ounce of distilled water. A sufficient quantity of this solution is placed in a flat-bottomed porcelain dish, and sheets of paper, one by one, are plunged within it; care being taken that no air bubbles remain between the paper and the solution; this may be prevented by slight pressure over the sheet by means of a bent glass rod. When a few sheets are thus immersed, they are turned over, and are taken out and hung to dry. Any number of sheets may thus be prepared.

An equally good result is obtained, by spreading over one side by means of a glass rod, as in the preparation of the Primaries, a solution of Chloride of Ammonium made by dissolving five grains of the chloride in one ounce of distilled water.

Second Operation.—Rendering the Paper sensitive to the Action of Light.

The solution required for this purpose is as follows:—

To a filtered solution of Nitrate of Silver (made by dissolving 50 grains of Crystallized Nitrate of Silver in one ounce of distilled water) some strong solution of Ammonia is added; the whole becomes at first of a dark brown colour, but when a sufficient quantity of Ammonia is added the solution becomes perfectly clear; a few crystals of Nitrate of Silver are then added till the solution is a little dull, forming "Ammoniacal Nitrate of Silver"; it is then ready for use.

The following operation is performed in a room illuminated by yellow light:—

By means of a glass rod this solution is spread over the paper, whilst pinned on a board; the paper is dried before a fire, and is then in a fit state to be used for producing a Secondary.

Third Operation.—Formation of the Photographic Copy.

A sheet of the paper so prepared is placed in a printing frame with its prepared side upwards, upon a bed of blotting paper resting upon a sheet of plate-glass; the Primary is then placed on the paper with its own face downwards; and as it is necessary, for obtaining a correct copy of the Primary, that it should be in close contact with the prepared surface, a second sheet of plate-glass is placed over it, and the two are pressed together by clamps and screws. The whole is then exposed to the light (the Primary to be copied being above the paper on which the copy is to be made). The time required to produce a copy depends, in a great measure, upon the thickness of the paper on which the Primary is made, and on the actinic quality of the light; a period of five minutes in a bright sunshine, or one hour in clear daylight, is generally sufficient.

Fourth Operation.—Fixing the Photographic Secondary.

When an impression has been thus obtained, it is necessary that the undecomposed Salts of Silver remaining in the paper be removed.

For this purpose the Secondary is at once plunged into water and well washed on both sides, passing a camel-hair brush over every part of it; it is then plunged into a solution of Hyposulphite of Soda (made by dissolving two or three ounces of the Hyposulphite in a pint of water), and is left through a period varying from half an hour to an hour. It is then removed, and washed in plain water several times; and running water is allowed to pass over it for twenty-four hours.

The sheets are then placed within the folds of drying cloths, till nearly dry, and finally between sheets of blotting paper.

The process of obtaining a Tertiary from a Secondary is in every respect the same as that of obtaining a Secondary from a Primary.

§ 28. *Personal Establishment.*

The personal establishment during the year 1868 has consisted of James Glaisher, Esq., F.R.S., Superintendent of the Magnetical and Meteorological Department, and Mr. William Carpenter Nash, Assistant.

Three or four computers have usually been attached to the Department.

Royal Observatory, Greenwich,
1870, April 18.

G. B. AIRY.

ROYAL OBSERVATORY, GREENWICH.

RESULTS

OF

MAGNETICAL OBSERVATIONS.

1868.

ROYAL OBSERVATORY GREENWICH.

REDUCTION

OF THE

MAGNETIC OBSERVATIONS

(EXCLUDING THE DAYS OF GREAT MAGNETIC DISTURBANCE).

1868.

TABLE I.—MEAN WESTERLY DECLINATION of the MAGNET on each ASTRONOMICAL DAY, as deduced from the MEAN of TWENTY-FOUR HOURLY MEASURES of ORDINATES of the PHOTOGRAPHIC REGISTER on that DAY.

1868.

Days of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	20°	20°	20°	20°	20°	20°	20°	20°	20°	20°	20°	20°
	′	′	′	′	′	′	′	′	′	′	′	′
1	14·1	14·4	14·6	..	15·1	14·2	13·5	11·1	13·9	12·1	9·8	9·7
2	14·1	15·6	16·1	..	14·3	14·0	12·3	10·9	12·6	11·0	10·3	9·1
3	14·3	15·6	14·6	15·3	15·0	14·4	12·0	11·6	13·5	12·0	10·0	9·4
4	14·0	16·4	..	15·1	..	..	12·6	12·2	12·9	11·5	9·8	9·4
5	14·3	16·2	..	15·0	15·3	14·1	11·4	11·8	13·4	12·0	9·8	9·9
6	14·0	14·5	..	15·7	15·0	..	12·3	12·0	..	11·9	9·8	9·4
7	13·7	15·3	..	15·4	14·4	..	11·4	12·4	12·5	11·6	10·2	10·1
8	14·0	15·1	..	15·0	15·8	13·9	13·0	11·7	12·6	11·5	9·7	9·6
9	..	16·8	..	15·6	15·0	13·9	15·4	11·1	12·3	11·7	10·0	10·2
10	..	15·5	..	15·7	15·7	14·8	..	12·9	11·5	11·6	9·7	9·3
11	14·8	15·5	..	15·8	13·2	13·5	13·9	11·8	11·8	11·3	9·7	10·5
12	14·8	15·3	..	16·5	15·6	13·3	11·6	12·4	12·2	11·4	10·0	9·2
13	14·1	15·5	15·2	14·9	14·5	14·0	11·0	11·6	12·6	11·8	9·9	9·9
14	15·0	14·6	14·9	17·0	14·0	14·2	..	12·0	13·6	10·4	10·2	9·5
15	15·0	..	15·7	16·3	..	12·6	12·7	13·7	..	10·9	9·7	8·5
16	15·6	..	14·7	15·8	..	12·6	12·1	14·1	13·5	7·8	9·3	9·2
17	14·9	..	14·9	15·7	14·5	12·5	12·6	14·1	13·8	10·6	10·3	8·9
18	15·2	15·4	13·9	13·6	15·2	12·9	12·6	12·9	14·6	10·1	11·3	8·7
19	15·6	13·7	14·8	..	15·4	12·1	13·2	12·1	14·0	..	..	8·7
20	16·7	..	..	14·1	17·2	11·7	13·5	12·9	..	10·7	10·4	8·0
21	15·8	..	15·5	13·6	15·2	12·9	..	14·4	13·1	10·5	9·7	8·9
22	16·8	15·1	13·3	14·3	15·2	11·5	12·7	..	13·8	..	9·3	9·0
23	17·1	15·4	..	14·8	15·4	13·4	11·8	..	14·7	11·1	7·9	8·5
24	15·1	..	15·1	14·0	14·9	13·9	13·0	14·6	13·6	..	9·7	8·3
25	16·5	..	16·1	15·5	14·1	12·8	13·0	14·2	13·2	..	9·6	8·3
26	17·6	..	15·4	12·8	17·9	13·7	13·1	14·0	14·5	9·8	9·8	8·1
27	16·2	..	..	..	16·1	13·5	12·6	13·1	..	9·7	9·4	7·9
28	15·4	..	15·7	14·5	13·7	13·7	13·5	13·9	11·4	9·4	9·5	8·8
29	16·3	..	15·0	..	13·2	..	12·5	15·4	10·6	10·5	8·9	9·0
30	15·7		..	15·4	12·6	12·7	12·1	..	..	11·6	9·8	8·7
31	15·6		16·3		12·1		12·0	13·4		10·2		8·5

TABLE II.—MEAN MONTHLY DETERMINATION of the WESTERN DECLINATION of the MAGNET at every HOUR of the DAY; obtained by taking the MEAN of all the DETERMINATIONS at the same HOUR of the DAY through the MONTH.

1868.

Hour: Greenwich Mean Solar Time.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	20°	20°	20°	20°	20°	20°	20°	20°	20°	20°	20°	20°
	′	′	′	′	′	′	′	′	′	′	′	′
0	17·2	18·1	19·7	21·0	19·9	17·7	17·3	19·0	19·8	16·3	13·4	12·2
1	18·0	19·1	21·5	23·1	20·9	18·8	18·8	20·3	19·6	16·8	13·9	12·6
2	17·6	19·4	21·4	22·9	20·3	19·2	19·2	19·8	18·9	16·0	13·0	12·5
3	16·8	18·7	20·0	20·6	19·3	18·4	18·6	18·3	16·7	14·9	11·9	11·9
4	16·0	17·3	18·3	18·6	17·8	17·7	17·5	15·6	15·2	12·9	11·1	11·4
5	15·8	15·9	15·7	16·8	16·7	16·4	15·8	14·1	13·0	11·5	10·5	10·4
6	15·7	15·4	15·0	15·6	15·6	15·2	14·2	13·1	12·2	10·7	9·9	9·4
7	15·1	15·0	14·5	14·8	14·8	13·6	12·9	12·5	12·0	11·0	9·4	8·9
8	14·7	14·7	13·7	14·5	14·2	12·7	12·4	11·9	10·6	9·2	8·9	7·6
9	13·3	13·0	13·0	14·0	13·9	13·1	11·6	11·6	10·9	8·6	7·6	6·9
10	12·3	12·4	13·6	13·4	13·8	12·5	11·3	10·4	10·7	8·4	7·0	6·7
11	12·8	12·0	13·7	13·2	12·9	11·9	11·3	10·3	10·6	8·5	7·4	6·9
12	13·2	12·2	13·8	12·5	13·0	11·5	11·1	10·7	10·8	8·3	7·9	7·0
13	14·1	13·4	13·5	12·2	13·0	11·9	10·4	10·9	10·8	8·7	8·2	7·2
14	14·5	13·9	13·1	11·9	12·6	11·2	9·8	11·4	11·2	9·0	8·5	7·7
15	15·0	14·1	12·0	12·0	12·5	11·2	10·0	10·6	11·3	9·8	8·8	7·9
16	14·7	14·4	12·8	12·9	12·2	10·3	9·3	10·3	11·2	9·4	9·4	8·0
17	15·3	15·1	13·4	13·1	12·3	9·6	8·7	9·5	10·9	9·9	9·0	7·9
18	15·3	15·6	13·7	12·4	11·8	9·4	8·5	8·9	11·2	10·0	8·9	8·4
19	15·2	15·5	13·6	11·3	11·7	9·2	8·9	8·6	11·0	9·4	9·2	8·7
20	15·1	14·4	12·4	10·7	11·6	9·4	9·3	9·4	11·0	8·7	8·9	8·7
21	14·8	14·3	12·4	12·0	13·0	10·3	10·3	10·8	12·0	8·9	9·3	8·7
22	15·7	15·8	14·4	14·7	15·0	12·9	12·1	13·3	14·1	11·1	10·5	9·4
23	16·6	17·3	17·3	18·1	17·7	15·7	14·3	16·2	17·0	14·0	12·1	10·8

TABLE III.

1868. Month.	MEAN WESTERLY DECLINATION of the MAGNET IN EACH MONTH, as deduced from the Mean of the MEAN HOURLY DETERMINATIONS in each MONTH (Table II.).	MONTHLY MEANS of all the Actual DIURNAL RANGES of the WESTERN DECLINATION, as deduced from the Twenty-four Hourly Measures of each day.
	° ′	′
January	20. 15·2	7·1
February	20. 15·3	10·6
March	20. 15·1	12·1
April	20. 15·1	15·0
May	20. 14·9	12·3
June	20. 13·3	11·9
July	20. 12·7	12·9
August	20. 12·8	13·9
September	20. 13·0	13·7
October	20. 10·9	12·6
November	20. 9·8	8·8
December	20. 9·1	8·6
Mean	20. 13·1	11·6

TABLE IV.—MEAN HORIZONTAL MAGNETIC FORCE (diminished by a Constant 0·8600 nearly) on each ASTRONOMICAL DAY, as deduced from the Mean of Twenty-four Hourly Measures of Ordinates of the Photographic Register on that Day.

1868.

Days of the Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1	0·1481	0·1432	0·1423	..	0·1399	0·1402	0·1433	0·1430	0·1433	0·1433	0·1449	0·1445
2	·1484	..	·1430	..	·1399	·1398	·1430	·1432	·1432	·1440	·1447	·1449
3	·1493	·1434	·1428	·1415	·1403	·1398	·1430	·1434	·1436	·1441	·1449	·1456
4	·1489	·1428	..	·1424	..	·1408	·1428	·1428	·1437	·1443	·1449	·1461
5	·1483	·1408	..	·1424	·1403	·1404	·1433	·1429	·1433	·1450	·1442	·1452
6	·1488	·1429	..	·1430	·1399	..	·1432	·1428	·1431	·1448	·1442	·1454
7	·1502	·1435	..	·1431	·1405	..	·1431	·1423	·1430	·1445	·1445	·1453
8	·1493	·1418	..	·1430	·1407	·1413	·1429	·1429	·1427	·1444	·1440	·1454
9	·1481	·1414	..	·1428	·1409	·1425	·1420	·1430	·1429	·1442	·1448	·1453
10	·1493	·1415	..	·1424	·1404	·1427	..	·1427	·1436	·1446	·1451	·1454
11	·1491	·1426	..	·1429	·1400	·1423	·1417	·1422	·1444	·1451	·1448	·1452
12	·1479	·1422	..	·1430	·1400	·1425	·1423	·1422	·1443	·1448	·1448	·1455
13	·1486	·1427	..	·1428	·1403	·1429	·1427	·1430	·1440	·1451	·1451	·1445
14	·1501	·1435	..	·1432	·1408	·1429	..	·1432	·1441	·1442	·1453	·1453
15	·1502	·1440	..	·1428	·1403	·1427	·1418	·1431	..	·1446	·1449	·1455
16	·1485	·1433	..	·1433	·1403	·1430	·1421	·1431	·1424	·1441	·1444	·1456
17	·1491	·1433	..	·1432	·1403	·1427	·1422	·1435	·1430	·1442	·1449	·1454
18	·1486	·1435	·1421	·1427	·1405	·1425	·1423	·1438	·1441	·1438	·1440	·1447
19	·1479	·1444	·1417	..	·1403	·1430	·1427	·1436	·1435	..	..	·1451
20	..	..	..	·1421	·1384	·1430	·1424	·1436	..	·1440	·1427	·1444
21	..	..	·1420	·1426	·1390	·1429	..	·1434	·1439	·1444	·1435	·1451
22	..	·1430	·1415	·1427	·1395	·1433	·1424	·1436	·1436	..	·1441	·1453
23	..	·1426	..	·1429	·1393	·1435	·1421	·1436	·1442	·1429	·1440	·1446
24	..	..	·1406	·1431	·1400	·1437	·1424	·1439	·1437	..	·1436	·1450
25	..	..	·1412	·1433	·1399	·1437	·1424	·1439	..	..	·1433	·1451
26	..	..	·1423	·1429	·1408	·1439	·1425	·1435	·1437	·1432	·1437	·1452
27	..	..	..	..	·1398	·1432	·1423	·1428	..	·1436	·1442	·1453
28	..	..	·1421	·1418	·1393	·1432	·1423	·1445	·1431	·1433	·1443	..
29	..	..	·1420	..	·1398	..	·1428	·1444	·1439	·1435	·1441	..
30	..		..	·1425	·1395	·1427	·1430	..	..	·1439	·1442	·1432
31	·1426		·1413		·1395		·1424	·1427		·1447		·1431

TABLE V.—MEAN MONTHLY DETERMINATION of the HORIZONTAL MAGNETIC FORCE (diminished by a Constant 0·8600 nearly), uncorrected for TEMPERATURE, at every HOUR of the DAY; obtained by taking the MEAN of all the DETERMINATIONS at the same HOUR of the DAY through each MONTH.

1868.

Hour, Greenwich Mean Solar Time.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
0	0·1483	0·1425	0·1410	0·1416	0·1393	0·1415	0·1414	0·1423	0·1427	0·1431	0·1437	0·1447
1	·1486	·1427	·1413	·1421	·1396	·1420	·1419	·1429	·1432	·1435	·1441	·1449
2	·1487	·1428	·1419	·1426	·1399	·1423	·1424	·1432	·1435	·1438	·1442	·1450
3	·1488	·1429	·1423	·1430	·1402	·1426	·1428	·1434	·1436	·1441	·1445	·1449
4	·1488	·1430	·1426	·1434	·1404	·1429	·1430	·1435	·1436	·1442	·1444	·1450
5	·1488	·1430	·1425	·1436	·1406	·1432	·1433	·1437	·1437	·1444	·1446	·1450
6	·1487	·1430	·1426	·1437	·1409	·1435	·1435	·1440	·1440	·1446	·1447	·1451
7	·1485	·1431	·1425	·1437	·1410	·1435	·1435	·1439	·1439	·1446	·1447	·1452
8	·1484	·1428	·1426	·1436	·1408	·1433	·1435	·1440	·1440	·1448	·1446	·1451
9	·1484	·1429	·1424	·1434	·1407	·1430	·1432	·1440	·1440	·1447	·1446	·1451
10	·1483	·1428	·1425	·1432	·1405	·1429	·1431	·1439	·1442	·1445	·1445	·1450
11	·1483	·1428	·1425	·1432	·1404	·1428	·1428	·1439	·1443	·1447	·1443	·1449
12	·1484	·1427	·1424	·1431	·1404	·1427	·1429	·1437	·1442	·1446	·1443	·1449
13	·1484	·1428	·1423	·1430	·1403	·1427	·1429	·1437	·1439	·1443	·1444	·1450
14	·1484	·1429	·1422	·1430	·1402	·1425	·1428	·1437	·1438	·1443	·1444	·1449
15	·1485	·1430	·1423	·1429	·1401	·1426	·1427	·1435	·1438	·1442	·1444	·1449
16	·1486	·1431	·1423	·1429	·1400	·1424	·1428	·1434	·1439	·1446	·1446	·1451
17	·1487	·1433	·1424	·1429	·1400	·1423	·1427	·1434	·1440	·1445	·1446	·1452
18	·1489	·1433	·1422	·1428	·1397	·1422	·1424	·1431	·1439	·1446	·1447	·1453
19	·1489	·1433	·1419	·1425	·1395	·1419	·1420	·1427	·1435	·1443	·1446	·1453
20	·1489	·1432	·1417	·1420	·1390	·1416	·1416	·1422	·1430	·1439	·1443	·1453
21	·1487	·1426	·1413	·1414	·1388	·1412	·1413	·1418	·1425	·1434	·1438	·1450
22	·1484	·1424	·1411	·1410	·1388	·1411	·1413	·1418	·1423	·1432	·1436	·1447
23	·1483	·1423	·1408	·1412	·1390	·1412	·1413	·1418	·1423	·1430	·1436	·1445

The Thermometer on the box inclosing the Horizontal Force Magnetometer was read sometimes nine times, sometimes twelve times, every day. The means of the readings taken for the same nominal hour through each month show no sensible Mean Diurnal Inequality of Temperature. In the months of January and February experiments were in progress for determining the temperature-correction by warming and cooling the room; but the mean of the temperatures leaves no sensible diurnal inequality.

TABLE VI.

1868.

Month.	MEAN HORIZONTAL MAGNETIC FORCE (diminished by a Constant 0·8600 nearly) IN EACH MONTH, as deduced from the Mean of the MEAN HOURLY DETERMINATIONS in each MONTH (Table V.), uncorrected for Temperature.	Mean Temperature.
		°
January	0·1486	55·1
February	·1429	56·9
March	·1421	60·2
April	·1427	60·4
May	·1400	61·5
June	·1424	63·5
July	·1425	66·5
August	·1432	66·1
September	·1436	65·4
October	·1442	61·5
November	·1443	61·5
December	·1450	61·1

In the months of January and February the temperatures were slightly disturbed by the experiments for temperature-correction.

TABLE VII.—MEAN VERTICAL MAGNETIC FORCE (diminished by a Constant 0·9600 nearly) on each ASTRONOMICAL DAY, as deduced from the Mean of Twenty-four Hourly Measures of Ordinates of the Photographic Register on that Day.

Days of the Month.	1868. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1	..	..	0·0384	..	0·0341	0·0344	0·0332	0·0325	0·0307	0·0252	0·0232	0·0209
2	..	..	·0395	..	·0338	·0339	·0342	·0340	·0311	·0241	·0225	·0213
3	..	..	·0390	0·0369	·0343	·0329	·0345	·0348	·0311	·0238	·0225	·0208
4	..	..	·0381	·0362	..	·0327	·0323	·0349	·0314	·0243	·0221	·0208
5	0·0433	0·0450	·0370	·0358	·0333	·0330	·0319	·0353	·0319	·0247	·0217	·0212
6	..	..	·0372	..	·0333	..	·0324	·0353	·0317	·0243	·0211	·0211
7	..	..	·0376	..	..	..	·0331	·0343	·0324	·0232	·0212	·0207
8	..	..	·0369	..	·0335	·0315	·0344	·0326	·0311	·0239	·0216	·0205
9	·0429	·0423	·0374	..	·0334	·0317	·0350	·0320	·0306	·0248	·0223	·0198
10	..	·0444	·0375	..	·0333	·0323	..	·0335	·0299	·0247	·0228	·0198
11	..	·0437	·0378	..	·0321	·0335	·0355	·0323	·0305	·0243	·0229	·0200
12	·0446	..	·0378	..	·0328	·0339	·0364	·0311	·0299	·0248	·0228	·0194
13	..	·0446	·0380	..	·0327	·0347	·0353	·0302	·0283	·0248	·0223	·0202
14	..	..	·0371	..	·0331	·0347	..	·0297	·0278	·0237	·0221	·0198
15	..	..	·0370	..	..	·0348	·0360	·0308	..	·0240	·0212	·0201
16	..	..	·0374	..	..	·0357	·0369	..	·0287	·0235	·0223	·0198
17	..	·0431	·0373	..	·0335	·0355	·0368	..	·0293	·0231	·0226	·0197
18	..	·0393	·0368	..	·0338	..	·0366	·0325	·0285	·0219	·0220	·0198
19	·0436	..	·0369	..	·0352	·0343	·0351	·0318	·0281	..	..	·0191
20	·0440	..	..	..	·0344	·0356	·0351	·0308	..	·0220	·0207	·0191
21	..	·0385	·0374	..	·0334	·0367	·0371	·0307	·0279	·0223	·0214	·0196
22	..	·0380	·0368	..	·0338	·0339	·0377	·0291	·0276	..	·0218	·0190
23	·0417	·0380	..	..	·0323	·0330	·0348	·0288	·0269	·0228	·0215	·0194
24	..	·0394	·0367	..	·0323	·0339	·0330	..	·0270	..	·0210	·0191
25	..	·0386	·0375	..	·0326	·0340	·0340	·0282	·0262	..	·0213	·0186
26	·0430	·0381	·0373	..	·0327	·0337	·0352	·0287	·0273	·0226	·0222	·0192
27	..	·0382	·0368	..	·0337	·0349	·0359	·0292	..	·0215	·0214	·0184
28	..	·0379	·0367	..	·0345	·0346	·0356	·0280	·0263	·0223	·0204	..
29	..	·0373	·0371	..	·0356	..	..	·0286	·0257	·0223	·0208	..
30	·0446		..	·0350	·0350	·0333	·0334	..	..	·0228	·0209	..
31	·0454		·0367		·0345		·0332	·0303		·0234		..

TABLE VIII.—MEAN MONTHLY DETERMINATION of the VERTICAL MAGNETIC FORCE (diminished by a Constant 0·9600 nearly) uncorrected for TEMPERATURE, at every HOUR of the DAY; obtained by taking the MEAN of all the DETERMINATIONS at the same HOUR of the DAY through each MONTH.

Hour. Greenwich Mean Solar Time.	1868. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
0	0·0424	0·0399	0·0369	0·0354	0·0329	0·0333	0·0341	0·0311	0·0288	0·0234	0·0216	0·0197
1	·0426	·0401	·0371	·0356	·0333	·0337	·0345	·0315	·0293	·0237	·0218	·0198
2	·0428	·0403	·0373	·0359	·0336	·0340	·0348	·0318	·0297	·0238	·0218	·0199
3	·0430	·0404	·0375	·0363	·0338	·0342	·0351	·0321	·0300	·0238	·0218	·0199
4	·0431	·0405	·0376	·0364	·0341	·0345	·0353	·0323	·0302	·0238	·0218	·0200
5	·0433	·0405	·0376	·0366	·0343	·0347	·0355	·0324	·0302	·0238	·0219	·0200
6	·0435	·0406	·0376	·0367	·0344	·0350	·0357	·0324	·0301	·0238	·0219	·0201
7	·0437	·0407	·0377	·0366	·0344	·0351	·0358	·0324	·0300	·0237	·0219	·0200
8	·0439	·0409	·0378	·0366	·0343	·0350	·0358	·0323	·0298	·0236	·0219	·0200
9	·0441	·0409	·0379	·0366	·0341	·0349	·0357	·0321	·0295	·0236	·0219	·0200
10	·0443	·0409	·0379	·0366	·0340	·0347	·0354	·0318	·0293	·0235	·0219	·0200
11	·0443	·0408	·0379	·0365	·0339	·0345	·0353	·0316	·0293	·0236	·0219	·0200
12	·0442	·0407	·0379	·0365	·0338	·0343	·0351	·0314	·0292	·0235	·0220	·0200
13	·0441	·0405	·0378	·0363	·0337	·0341	·0349	·0312	·0291	·0235	·0220	·0200
14	·0440	·0404	·0376	·0361	·0336	·0340	·0347	·0311	·0290	·0235	·0219	·0200
15	·0440	·0403	·0375	·0360	·0335	·0338	·0345	·0310	·0288	·0235	·0219	·0199
16	·0439	·0403	·0374	·0358	·0334	·0336	·0343	·0309	·0287	·0235	·0218	·0199
17	·0439	·0403	·0373	·0357	·0333	·0334	·0341	·0308	·0286	·0234	·0218	·0199
18	·0440	·0403	·0372	·0356	·0332	·0333	·0339	·0308	·0285	·0234	·0218	·0198
19	·0440	·0402	·0372	·0355	·0331	·0333	·0339	·0307	·0284	·0234	·0217	·0198
20	·0440	·0402	·0371	·0353	·0330	·0332	·0339	·0307	·0284	·0233	·0217	·0198
21	·0439	·0401	·0369	·0351	·0329	·0332	·0340	·0306	·0284	·0233	·0217	·0197
22	·0438	·0399	·0367	·0349	·0328	·0331	·0339	·0306	·0284	·0232	·0216	·0197
23	·0439	·0400	·0367	·0348	·0328	·0331	·0339	·0306	·0284	·0231	·0215	·0196

The Thermometer on the box inclosing the Vertical Force Magnetometer was read sometimes nine times, sometimes twelve times, every day. The means of the readings taken for the same nominal hour through each month show no sensible Mean Diurnal Inequality of Temperature. In the months of January and February experiments were in progress for determining the temperature-correction by warming and cooling the room; but the mean of the temperatures leaves no sensible diurnal inequality.

TABLE IX.

1868.

Month.	MEAN VERTICAL MAGNETIC FORCE (diminished by a Constant 0·9600 nearly) in EACH MONTH, as deduced from the Mean of the MEAN HOURLY DETERMINATIONS in each Month (Table VIII.), uncorrected for Temperature.	Mean Temperature.
January	0·0437	59°·6
February	·0404	60·9
March	·0374	60·5
April	·0360	60·9
May	·0336	61·9
June	·0340	63·9
July	·0348	67·1
August	·0314	66·7
September	·0292	66·4
October	·0235	61·9
November	·0218	61·6
December	·0199	61·2

In the months of January and February the temperatures were slightly disturbed by the experiments for temperature-correction.

TABLE X.—MEAN, through the Range of Months, of the MONTHLY MEAN DETERMINATIONS of the DIURNAL INEQUALITIES of DECLINATION, HORIZONTAL FORCE, and VERTICAL FORCE for the Year 1868.

January to December.

Hour. Greenwich Mean Solar Time.	Declination.	Horizontal Force.	Vertical Force.
0	+ 4′·53	− 0·00078	− 0·00052
1	+ 5·52	− 39	− 23
2	+ 5·25	− 10	0
3	+ 4·07	+ 13	+ 18
4	+ 2·68	+ 27	+ 32
5	+ 1·28	+ 41	+ 43
6	+ 0·40	+ 57	+ 51
7	− 0·22	+ 55	+ 53
8	− 1·01	+ 50	+ 52
9	− 1·64	+ 41	+ 47
10	− 2·06	+ 33	+ 38
11	− 2·14	+ 28	+ 32
12	− 2·10	+ 23	+ 24
13	− 1·91	+ 18	+ 13
14	− 1·87	+ 13	+ 2
15	− 1·83	+ 12	− 8
16	− 1·86	+ 18	− 18
17	− 1·87	+ 21	− 27
18	− 1·93	+ 13	− 33
19	− 2·07	− 9	− 37
20	− 2·30	− 40	− 43
21	− 1·70	− 81	− 49
22	+ 0·15	− 99	− 59
23	+ 2·49	− 102	− 61

ROYAL OBSERVATORY, GREENWICH.

INDICATIONS

OF

MAGNETOMETERS

ON TWENTY-THREE DAYS OF GREAT MAGNETIC DISTURBANCE.

1868.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Feb. 20		Feb. 20		Feb. 20		Feb. 20		
h m	° ′ ″	h m		h m		h m	°	°
0. 0	20. 19. 30	0. 0	·1452	0. 0	·01673	0. 0	52·1	53·1
0. 9	20. 15	0. 32	·1452	0. 38	·01735	1. 0	52·9	54·4
0. 32	19. 10	0. 48	·1458	2. 0	·01829	3. 0	54·2	56·4
0. 46	21. 0	0. 59	·1453	2. 14	·01843	6. 0	55·1	57·7
1. 2	19. 50	1. 17	·1458	2. 40	·01890	9. 0	56·1	58·5
1. 9	20. 20	1. 38	·1455	4. 33	·02052	21. 10	57·5	60·0
1. 26	19. 50	1. 52	·1458	5. 4	·02095	22. 0	57·9	60·3
1. 36	19. 45	2. 0	·1455	5. 14	·02122	23. 0	58·3	60·9
1. 58	20. 40	2. 22	·1453	5. 21	·02115			
2. 22	19. 50	2. 31	·1457	5. 31	·02124			
2. 32	21. 5	2. 51	·1459	5. 43	·02118			
2. 39	20. 20	3. 7	·1447	5. 50	·02124			
2. 46	21. 30	3. 17	·1452	5. 58	·02118			
2. 52	20. 0	3. 20	·1450	6. 4	·02133			
3. 8	18. 20	3. 30	·1454	6. 21	·02129			
3. 38	20. 50	3. 46	·1439	6. 38	·02152			
3. 50	19. 50	4. 1	·1439	6. 51	·02147			
3. 59	20. 15	4. 8	·1441	7. 9	·02155			
4. 11	19. 55	4. 12	·1439	7. 24	·02170			
4. 17	20. 50	4. 20	·1441	7. 41	·02168			
4. 22	20. 30	4. 38	·1436	7. 56	·02180			
4. 32	21. 50	4. 50	·1430	8. 3	·02193			
4. 39	20. 45	4. 59	·1412	8. 20	·02180			
4. 51	21. 50	5. 8	·1422	8. 35	·02175			
5. 3	17. 30	5. 12	·1416	8. 46	·02191			
5. 12	18. 25	5. 22	·1434	8. 54	·02185			
5. 18	13. 55	5. 30	·1437	9. 0	·02164			
5. 29	18. 10	5. 36	·1432	9. 11	·02193			
5. 38	12. 10	5. 40	·1440	9. 26	·02172			
5. 46	12. 45	5. 47	·1444	9. 51	·02148			
5. 57	8. 0	5. 52	·1434	10. 3	·02160			
6. 10	18. 15	6. 0	·1449	10. 14	·02130			
6. 21	5. 0	6. 10	·1438	10. 27	·02168			
6. 39	17. 45	6. 22	·1443	10. 43	·02165			
6. 50	16. 0	6. 31	·1451	10. 50	·02175			
6. 54	17. 0	6. 40	·1445	10. 58	·02172			
7. 5	14. 50	6. 42	·1439	11. 13	·02198			
7. 20	16. 40	6. 49	·1437	11. 24	·02224			
7. 31	13. 55	6. 53	·1440	11. 32	·02223			
7. 51	4. 25	7. 2	·1434	11. 38	·02238			
8. 3	11. 10	7. 12	·1441	12. 6	·02240			
8. 24	12. 0	7. 30	·1441	12. 10	·02230			
8. 33	9. 20	7. 38	·1437	12. 30	·02250			
8. 43	20. 13. 10	7. 43	·1436	12. 57	·02238			
9. 0	19. 53. 55	7. 52	·1447	13. 6	·02238			
9. 10	19. 58. 55	8. 0	·1466	13. 17	·02230			
9. 20	20. 2. 10	8. 3	·1466	13. 33	·02238			
9. 23	1. 40	8. 10	·1456	13. 47	·02249			
9. 40	7. 15	8. 25	·1449	14. 19	·02262			
9. 49	7. 0	8. 28	·1445	14. 53	·02295			
10. 2	12. 50	8. 32	·1439	15. 25	·02300			
10. 11	20. 2. 30	8. 43	·1451	15. 40	·02318			
10. 16	19. 59. 50	8. 55	·1438	15. 56	·02319			
10. 35	20. 8. 10	9. 3	·1469	17. 31	·02358			
10. 43	8. 10	9. 12	·1488	17. 36	·02356			
11. 4	4. 0	9. 14	·1495	17. 57	·02375			
11. 12	4. 50	9. 20	·1498	18. 50	·02388			
11. 22	8. 5	9. 23	·1492	19. 20	·02393			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Feb. 20		Feb. 20		Feb. 20				
h m	° ′ ″	h m		h m		h m	°	°
11. 32	20. 8. 35	9. 30	·1495	19. 41	·02407			
11. 38	9. 50	9. 39	·1497	20. 24	·02435			
11. 49	8. 45	9. 42	·1494	20. 44	·02440			
12. 3	8. 15	9. 52	·1473	21. 11	·02440			
12. 12	6. 40	10. 0	·1474	22. 38	·02440			
12. 32	14. 0	10. 10	·1430	23. 3	·02455			
12. 47	16. 40	10. 13	·1433	23. 30	·02468			
12. 53	16. 5	10. 23	·1452	23. 59	·02483			
13. 2	17. 5	10. 29	·1453					
13. 20	13. 30	10. 43	·1425					
13. 24	13. 55	10. 56	·1417					
13. 32	11. 20	11. 1	·1411					
13. 45	10. 0	11. 8	·1411					
14. 7	10. 55	11. 10	·1410					
14. 29	8. 25	11. 22	·1412					
14. 49	11. 0	11. 31	·1409					
15. 1	14. 0	11. 40	·1420					
15. 7	13. 45	11. 47	·1423					
15. 14	14. 15	11. 56	·1432					
15. 29	12. 30	12. 8	·1432					
15. 42	13. 40	12. 12	·1427					
15. 58	12. 0	12. 26	·1435					
16. 22	11. 5	12. 32	·1434					
16. 55	12. 55	12. 39	·1431					
17. 5	12. 50	12. 45	·1432					
17. 12	13. 30	13. 2	·1427					
17. 26	12. 30	13. 7	·1428					
17. 30	12. 50	13. 13	·1426					
17. 45	11. 10	13. 19	·1427					
18. 1	12. 20	13. 32	·1425					
18. 11	11. 45	13. 48	·1434					
18. 19	12. 10	14. 6	·1432					
18. 27	11. 50	14. 18	·1427					
18. 41	14. 35	14. 27	·1429					
18. 59	14. 25	14. 37	·1434					
19. 38	12. 0	14. 41	·1433					
19. 50	12. 40	14. 53	·1435					
20. 0	12. 5	15. 3	·1431					
20. 20	13. 50	15. 17	·1432					
20. 27	13. 5	15. 32	·1427					
20. 35	13. 0	15. 40	·1432					
20. 40	14. 40	15. 57	·1432					
20. 48	13. 20	16. 7	·1434					
20. 53	14. 0	16. 28	·1432					
20. 59	13. 20	16. 38	·1434					
21. 7	14. 15	16. 43	·1432					
21. 13	13. 45	17. 3	·1435					
21. 29	15. 45	17. 9	·1434					
21. 37	14. 50	17. 32	·1435					
21. 59	16. 30	17. 36	·1437					
22. 4	16. 10	17. 42	·1433					
22. 10	17. 0	17. 52	·1433					
22. 39	16. 45	18. 20	·1432					
22. 54	16. 25	18. 26	·1429					
23. 3	17. 0	18. 32	·1433					
23. 12	19. 10	18. 36	·1432					
23. 22	18. 50	18. 52	·1436					
	(†)	19. 12	·1436					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

February 20. Experiments for effect of temperature on the H.F. and V.F. Magnets were in progress.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
		Feb. 20						
h m	° ′ ″	h m		h m		h m	°	°
		19. 42	·1428					
		19. 52	·1429					
		20. 0	·1426					
		20. 9	·1428					
		20. 13	·1426					
		20. 21	·1427					
		20. 27	·1425					
		20. 42	·1430					
		20. 50	·1426					
		20. 57	·1429					
		21. 2	·1426					
		21. 4	·1430					
		21. 17	·1425					
		21. 24	·1428					
		21. 52	·1429					
		22. 0	·1431					
		22. 3	·1429					
		22. 13	·1431					
		23. 1	·1430					
		23. 26	·1432					
			(†)					
Mar. 20		Mar. 20		Mar. 20		Mar. 20		
0. 0	20. 21. 30	0. 0	·1391		(†)	0. 0	60·0	60·2
0. 10	22. 45	0. 16	·1384	0. 48	·02422	1. 0	60·0	60·0
0. 22	22. 55	0. 20	·1387	1. 10	·02418	3. 0	60·0	60·0
0. 31	25. 30	0. 28	·1403	1. 17	·02414	6. 0	60·1	60·1
0. 38	25. 0	0. 39	·1392	1. 23	·02413	9. 0	60·3	60·9
0. 50	26. 0	0. 43	·1396	1. 30	·02447	21. 0	61·8	62·0
0. 54	28. 5	0. 53	·1409	1. 48	·02500	22. 0	60·6	60·6
1. 4	28. 10	0. 58	·1410	1. 57	·02507	23. 0	60·6	60·8
1. 9	29. 20	1. 2	·1401	2. 13	·02505			
1. 22	27. 30	1. 18	·1390	2. 29	·02490			
1. 27	25. 25	1. 22	·1397	3. 5	·02512			
1. 32	25. 55	1. 27	·1393	3. 25	·02492			
1. 36	25. 0	1. 30	·1399	3. 46	·02510			
1. 40	26. 15	1. 32	·1394	4. 0	·02502			
1. 45	25. 50	1. 38	·1404	4. 16	·02530			
1. 52	26. 30	1. 42	·1406	4. 21	·02530			
2. 0	20. 55	1. 48	·1410	4. 30	·02548			
2. 3	17. 50	1. 52	·1405	4. 38	·02540			
2. 15	20. 50	2. 0	·1402	4. 49	·02517			
2. 22	23. 10	2. 12	·1399	5. 11	·02523			
2. 32	19. 55	2. 16	·1392	5. 18	·02513			
2. 38	19. 20	2. 18	·1396	5. 29	·02525			
2. 47	21. 0	2. 28	·1389	5. 48	·02520			
3. 2	26. 55	2. 37	·1406	5. 55	·02524			
3. 17	25. 50	2. 51	·1424	6. 23	·02503			
3. 22	24. 45	2. 57	·1431	6. 30	·02515			
3. 33	25. 40	3. 13	·1413	6. 50	·02511			
3. 40	27. 5	3. 33	·1424	7. 0	·02518			
3. 52	26. 55	3. 42	·1425	7. 17	·02519			
4. 8	25. 0	3. 56	·1403	7. 57	·02532			
4. 12	27. 20	4. 2	·1410	8. 40	·02532			
4. 23	16. 40	4. 13	·1393	8. 59	·02540			
4. 37	21. 20	4. 28	·1428	9. 40	·02481			
4. 47	19. 0	4. 31	·1424	10. 12	·02518			
5. 2	18. 35	4. 38	·1412	11. 39	·02534			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Mar. 20		Mar. 20		Mar. 20				
h m	° ′ ″	h m		h m		h m	°	°
5. 9	20. 19. 0	4. 42	·1410	11. 56	·02540			
5. 18	15. 50	4. 52	·1417	12. 20	·02530			
5. 22	16. 45	5. 12	·1409	12. 25	·02535			
5. 33	15. 30	5. 20	·1412	12. 35	·02523			
5. 42	14. 55	5. 42	·1415	12. 41	·02525			
5. 53	16. 55	5. 47	·1418	12. 58	·02500			
6. 8	15. 20	6. 2	·1407	13. 5	·02502			
6. 12	17. 5	6. 13	·1403	13. 16	·02466			
6. 24	15. 35	6. 26	·1418	13. 29	·02448			
6. 32	20. 0	6. 30	·1416	13. 37	·02440			
6. 40	18. 5	6. 35	·1418	13. 43	·02450			
6. 47	18. 40	6. 48	·1410	14. 2	·02434			
6. 52	16. 55	6. 52	·1412	14. 16	·02443			
7. 2	19. 30	7. 1	·1407	14. 25	·02433			
7. 16	18. 30	7. 11	·1404	14. 40	·02435			
7. 32	14. 20	7. 30	·1416	14. 58	·02457			
7. 49	13. 10	7. 38	·1413	15. 18	·02465			
7. 56	14. 0	7. 49	·1414	15. 26	·02460			
8. 6	9. 50	7. 58	·1407	15. 37	·02467			
8. 12	10. 40	8. 7	·1410	16. 9	·02500			
8. 19	4. 0	8. 11	·1402	16. 32	·02513			
8. 26	4. 45	8. 18	·1408	17. 0	·02520			
8. 36	20. 0. 25	8. 27	·1403	17. 36	·02520			
8. 45	19. 53. 0	8. 30	·1405	17. 59	·02523			
8. 59	20. 1. 55	8. 35	·1402	18. 12	·02530			
9. 3	1. 30	8. 42	·1422	18. 20	·02525			
9. 15	3. 45	8. 52	·1437	18. 30	·02528			
9. 20	3. 10	9. 0	·1424	18. 59	·02525			
9. 30	6. 40	9. 11	·1415	19. 10	·02540			
9. 40	5. 50	9. 21	·1421	20. 21	·02550			
9. 46	6. 40	9. 32	·1406	20. 29	·02560			
9. 58	5. 35	9. 41	·1402	20. 39	·02550			
10. 8	7. 20	9. 51	·1393	21. 12	·02556			
10. 17	12. 30	10. 9	·1409	21. 32	·02546			
10. 27	12. 30	10. 12	·1409		(†)			
10. 32	13. 20	10. 20	·1405	22. 19	·02508			
11. 26	13. 50	10. 25	·1407	22. 36	·02492			
11. 32	13. 20	10. 30	·1405	22. 59	·02493			
11. 46	14. 55	10. 41	·1410		(†)			
11. 51	16. 40	11. 12	·1409	23. 30	·02496			
12. 12	16. 25	11. 22	·1406	23. 59	·02497			
12. 30	17. 45	11. 32	·1410					
12. 41	22. 10	11. 34	·1408					
12. 53	21. 30	11. 50	·1413					
13. 2	25. 5	11. 53	·1411					
13. 10	23. 55	12. 0	·1414					
13. 17	21. 5	12. 11	·1414					
13. 23	20. 35	12. 20	·1422					
13. 32	19. 40	12. 27	·1420					
13. 38	21. 10	12. 38	·1427					
13. 54	20. 30	12. 47	·1419					
14. 7	23. 50	12. 59	·1433					
14. 25	20. 20	13. 12	·1421					
14. 40	12. 25	13. 30	·1414					
14. 48	10. 25	13. 38	·1418					
14. 59	9. 10	13. 53	·1409					
15. 7	9. 5	14. 2	·1409					
15. 16	7. 55	14. 30	·1387					

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Mar. 20		Mar. 20						
h m	° ′ ″	h m		h m		h m	°	°
15. 29	20. 7. 30	14. 58	·1413					
15. 37	6. 40	15. 12	·1416					
15. 50	9. 20	15. 23	·1412					
15. 55	9. 25	15. 30	·1408					
16. 5	10. 0	15. 32	·1411					
16. 20	10. 0	15. 50	·1406					
16. 31	12. 5	15. 57	·1407					
16. 46	13. 0	16. 3	·1406					
16. 57	13. 10	16. 32	·1411					
17. 4	14. 25	16. 49	·1407					
17. 18	13. 55	17. 31	·1411					
17. 28	12. 55	17. 33	·1408					
17. 38	12. 45	17. 42	·1410					
17. 46	14. 0	18. 9	·1410					
17. 58	14. 5	18. 20	·1399					
18. 5	16. 40	18. 45	·1406					
18. 14	21. 50	18. 53	·1401					
18. 20	21. 20	19. 9	·1418					
18. 23	22. 30	19. 22	·1417					
18. 38	19. 50	19. 42	·1409					
18. 41	18. 20	19. 52	·1412					
18. 45	18. 50	19. 56	·1410					
18. 48	16. 50	20. 12	·1410					
18. 52	17. 20	20. 19	·1407					
18. 55	13. 40	20. 22	·1410					
19. 1	13. 0	20. 31	·1405					
19. 10	15. 20	20. 42	·1407					
19. 13	14. 50	20. 59	·1404					
19. 31	15. 50	21. 10	·1398					
19. 49	14. 50	21. 12	·1401					
20. 10	15. 5	21. 21	·1403					
20. 18	14. 0	21. 29	·1398					
20. 25	15. 50		(†)					
20. 32	13. 20	22. 13	·1390					
20. 40	14. 10	22. 21	·1393					
20. 42	15. 0	22. 32	·1386					
20. 52	14. 0	22. 51	·1394					
20. 56	14. 50	23. 1	·1391					
21. 3	14. 10	23. 13	·1399					
21. 10	12. 25	23. 20	·1395					
21. 31	13. 20	23. 22	·1402					
	(†)	23. 38	·1403					
22. 18	15. 20	23. 59	·1400					
22. 28	17. 10							
22. 43	16. 0							
22. 49	18. 20							
22. 56	17. 0							
22. 59	18. 0							
23. 7	16. 40							
23. 18	17. 10							
23. 22	16. 55							
23. 28	18. 0							
23. 59	19. 0							
Mar. 23		Mar. 23		Mar. 23		Mar. 23		
0. 0	20. 27. 0	0. 0	·1394	0. 0	·02324	0. 0	60·3	60·1
0. 20	29. 0	0. 30	·1404	0. 35	·02350	1. 0	60·2	60·2
0. 30	30. 25	0. 38	·1399	0. 59	·02377	3. 0	60·2	60·2

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Mar. 23		Mar. 23		Mar. 23		Mar. 23		
h m	° ′ ″	h m		h m		h m	°	°
0. 35	20. 29. 10	0. 47	·1405	1. 17	·02382	6. 0	60·0	60·0
0. 40	29. 35	0. 50	·1402	1. 32	·02399	9. 0	60·0	60·3
0. 53	31. 30	0. 58	·1407	1. 49	·02430	21. 0	58·4	57·9
1. 0	32. 55	1. 5	·1399	1. 58	·02433	22. 0	59·1	58·1
1. 8	33. 20	1. 10	·1402	2. 27	·02466	23. 0	59·1	58·8
1. 11	34. 15	1. 15	·1399	2. 33	·02490			
1. 17	33. 40	1. 27	·1407	2. 46	·02557			
1. 23	34. 10	1. 32	·1405	2. 53	·02547			
1. 39	32. 5	1. 47	·1418	3. 4	·02535			
1. 48	34. 20	1. 52	·1415	4. 34	·02560			
1. 59	32. 15	2. 2	·1425	4. 54	·02580			
2. 7	34. 30	2. 12	·1425	5. 19	·02555			
2. 18	36. 25	2. 15	·1420	5. 28	·02592			
2. 30	32. 55	2. 20	·1422	5. 38	·02520			
2. 34	34. 25	2. 26	·1413	5. 48	·02525			
2. 42	32. 40	2. 33	·1424	5. 59	·02510			
2. 53	19. 50	2. 39	·1424	6. 10	·02491			
2. 59	21. 5	2. 41	·1436	6. 22	·02492			
3. 20	23. 10	2. 49	·1433	6. 48	·02465			
3. 38	29. 20	2. 58	·1439	7. 28	·02443			
3. 48	26. 10	3. 7	·1427	8. 17	·02440			
3. 53	27. 10	3. 20	·1416	8. 50	·02448			
4. 0	26. 0	3. 32	·1427	9. 26	·02420			
4. 8	27. 5	3. 42	·1415	9. 46	·02414			
4. 13	25. 40	3. 52	·1423	10. 3	·02403			
4. 22	20. 20	4. 6	·1417	10. 49	·02400			
4. 29	22. 5	4. 18	·1403	11. 16	·02407			
4. 42	23. 55	4. 31	·1419	11. 33	·02398			
4. 57	16. 45	4. 50	·1396	12. 13	·02400			
5. 2	16. 55	4. 58	·1411	13. 8	·02382			
5. 7	15. 35	5. 0	·1409	13. 43	·02384			
5. 26	15. 0	5. 11	·1416	14. 45	·02363			
5. 32	17. 40	5. 21	·1412	15. 15	·02356			
5. 35	23. 35	5. 26	·1414	15. 24	·02350			
5. 41	17. 10	5. 32	·1451	15. 38	·02341			
5. 45	17. 40	5. 39	·1411	15. 53	·02326			
5. 51	11. 10	5. 46	·1404	16. 9	·02306			
5. 59	14. 30	5. 51	·1414	16. 20	·02293			
6. 0	13. 35	6. 2	·1403	16. 38	·02233			
6. 6	13. 20	6. 9	·1411	16. 55	·02210			
6. 8	9. 10	6. 11	·1381	17. 14	·02219			
6. 11	20. 45	6. 20	·1372	18. 7	·02160			
6. 30	5. 30	6. 31	·1397	19. 20	·02157			
6. 35	8. 50	6. 49	·1400	20. 0	·02175			
6. 40	11. 0	6. 57	·1398	20. 35	·02182			
6. 47	11. 20	7. 21	·1404	21. 37	·02173			
6. 51	12. 25	7. 31	·1400	22. 9	·02170			
7. 3	12. 5	8. 9	·1409	22. 37	·02180			
7. 10	13. 20	8. 30	·1406	22. 45	·02175			
7. 14	13. 20	8. 41	·1408	23. 15	·02192			
7. 25	15. 20	8. 49	·1408	23. 20	·02208			
7. 43	14. 10	9. 25	·1420	23. 45	·02220			
7. 53	14. 55	9. 39	·1414	23. 59	·02235			
8. 9	16. 20	9. 47	·1418					
8. 37	15. 0	9. 52	·1416					
8. 46	15. 50	10. 2	·1418					
8. 56	14. 55	10. 17	·1412					
9. 12	14. 35	10. 39	·1422					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Mar. 23		Mar. 23						
h m	° ′ ″	h m		h m		h m	°	°
9. 20	20. 13. 40	10. 58	·1414					
9. 28	14. 40	11. 11	·1410					
9. 41	13. 10	11. 29	·1413					
9. 47	14. 20	11. 43	·1410					
9. 57	14. 5	12. 1	·1416					
10. 7	16. 25	12. 4	·1414					
10. 29	13. 5	12. 22	·1415					
10. 39	14. 0	12. 49	·1409					
11. 2	13. 40	13. 0	·1409					
11. 12	15. 0	13. 7	·1410					
11. 30	14. 20	13. 29	·1406					
11. 50	11. 5	13. 39	·1410					
12. 2	10. 20	13. 59	·1407					
12. 20	10. 40	14. 2	·1409					
12. 39	11. 25	14. 9	·1406					
12. 57	10. 40	14. 44	·1411					
13. 17	9. 20	14. 52	·1411					
13. 31	11. 5	15. 2	·1413					
13. 37	11. 10	15. 10	·1411					
13. 57	13. 30	15. 22	·1416					
14. 2	13. 30	15. 32	·1412					
14. 9	14. 3	15. 43	·1410					
14. 13	13. 55	15. 58	·1397					
14. 50	14. 0	16. 10	·1396					
15. 6	13. 20	16. 33	·1414					
15. 20	10. 55	16. 38	·1413					
15. 28	10. 50	16. 47	·1418					
15. 32	9. 20	16. 52	·1418					
15. 40	8. 40	16. 57	·1416					
15. 47	9. 25	17. 12	·1427					
15. 52	11. 20	17. 20	·1428					
15. 59	11. 0	17. 34	·1423					
16. 10	13. 5	17. 56	·1429					
16. 29	20. 55	18. 14	·1417					
16. 36	18. 35	18. 32	·1421					
16. 42	15. 0	18. 40	·1418					
16. 48	13. 5	18. 50	·1418					
16. 52	11. 30	19. 0	·1414					
16. 59	12. 5	19. 9	·1416					
17. 1	11. 10	19. 19	·1409					
17. 5	12. 10	19. 28	·1411					
17. 15	14. 40	19. 38	·1412					
17. 28	17. 10	19. 52	·1402					
17. 35	18. 30	20. 21	·1390					
17. 47	19. 50	20. 42	·1389					
18. 4	14. 50	20. 49	·1385					
18. 12	12. 25	20. 54	·1387					
18. 22	11. 50	21. 2	·1379					
18. 41	10. 30	21. 10	·1383					
18. 58	11. 0	21. 21	·1375					
19. 10	10. 50	21. 40	·1377					
19. 20	8. 50	21. 43	·1371					
19. 36	9. 10	21. 59	·1366					
19. 42	10. 20	22. 13	·1364					
20. 6	9. 30	22. 27	·1368					
20. 18	11. 0	22. 32	·1366					
20. 32	11. 0	22. 43	·1372					
20. 46	14. 25	22. 54	·1378					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Mar. 23		Mar. 23						
h m	° ′ ″	h m		h m		h m	°	°
21. 0	20. 15. 30	23. 3	·1382					
21. 13	19. 30	23. 11	·1380					
21. 25	23. 0		(†)					
21. 39	21. 50							
21. 50	23. 20							
22. 9	22. 50							
22. 27	24. 10							
22. 32	23. 55							
22. 38	24. 50							
22. 49	24. 50							
22. 52	23. 50							
23. 0	23. 25							
23. 6	21. 10							
23. 12	22. 55							
23. 37	25. 50							
23. 59	25. 0							
Mar. 30		Mar. 30		Mar. 30		Mar. 30		
0. 0	20. 20. 50	0. 0	·1430	0. 0	·02330	0. 0	60 ·2	60 ·2
0. 32	20. 50	0. 37	·1427	1. 40	·02370	1. 0	60 ·2	60 ·6
0. 42	21. 0	0. 47	·1431	2. 11	·02368	2. 0	60 ·2	60 ·2
0. 49	22. 20	0. 51	·1438	2. 31	·02392	3. 0	60 ·1	60 ·3
1. 4	21. 55	1. 7	·1435	3. 38	·02390	6. 0	60 ·3	60 ·6
1. 13	22. 40	1. 18	·1439	4. 1	·02408	9. 0	60 ·0	60 ·3
1. 22	22. 40	1. 22	·1437	4. 50	·02418	11. 0	60 ·2	60 ·4
1. 36	24. 15	1. 38	·1442	5. 8	·02429	12. 0	60 ·2	60 ·3
1. 42	23. 10	1. 44	·1434	5. 30	·02429	12. 40	60 ·2	60 ·2
1. 56	23. 45	1. 59	·1438	5. 38	·02448	21. 0	59 ·9	59 ·3
2. 9	22. 45	2. 11	·1434	5. 45	·02430	22. 0	60 ·7	60 ·7
2. 30	24. 30	2. 25	·1436	7. 20	·02444	23. 0	60 ·4	60 ·4
2. 42	23. 0	2. 32	·1444	7. 27	·02440			
2. 51	22. 45	2. 57	·1438	7. 38	·02452			
2. 57	22. 55	3. 0	·1439	7. 55	·02450			
3. 38	19. 55	3. 18	·1427	8. 30	·02456			
4. 46	19. 0	3. 20	·1430	8. 48	·02448			
5. 34	17. 50	3. 41	·1420	9. 20	·02445			
5. 40	18. 45	3. 52	·1424	9. 34	·02452			
5. 47	18. 20	3. 58	·1428	10. 2	·02420			
5. 57	17. 20	4. 13	·1429	10. 39	·02393			
6. 11	17. 50	4. 20	·1433	10. 53	·02396			
6. 22	17. 15	4. 26	·1430	11. 10	·02382			
6. 56	16. 30	4. 32	·1435	11. 35	·02383			
7. 4	16. 40	4. 39	·1432	11. 44	·02392			
7. 16	16. 5	4. 45	·1435	12. 15	·02342			
7. 32	14. 20	4. 52	·1431	12. 31	·02350			
7. 50	16. 10	5. 10	·1436	12. 40	·02343			
7. 57	15. 25	5. 19	·1431	13. 9	·02350			
8. 10	15. 20	5. 34	·1433	14. 0	·02322			
8. 30	12. 35	5. 40	·1455	14. 2	·02330			
8. 33	12. 20	5. 47	·1442	14. 20	·02300			
8. 58	20. 3. 45	5. 52	·1445	14. 41	·02290			
9. 19	19. 54. 20	6. 18	·1437	15. 6	·02310			
9. 35	51. 0	6. 20	·1440	15. 19	·02305			
9. 50	52. 10	6. 29	·1438	15. 32	·02308			
10. 9	59. 0	6. 37	·1440	16. 1	·02286			
10. 14	19. 53. 20	6. 52	·1431	16. 41	·02303			
10. 40	20. 0. 50	7. 1	·1434	16. 51	·02300			
10. 49	1. 35	7. 17	·1435	19. 30	·02297			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H.F. Magnet.	Of V. F. Magnet.
Mar.30		Mar.30		Mar.30				
h m	° ′ ″	h m		h m		h m	°	°
11. 0	20. 3. 45	7. 27	·1431	20. 42	·02277			
11. 24	2. 30	7. 37	·1436					
11. 49	3. 55	7. 41	·1434	21. 0	·02280			
12. 4	18. 0	7. 47	·1435	22. 30	·02331			
12. 26	13. 20	7. 52	·1430		(†)			
12. 32	13. 40	8. 1	·1433					
12. 51	11. 15	8. 13	·1428					
13. 13	6. 40	8. 28	·1430					
13. 39	6. 10	8. 47	·1419					
13. 51	9. 45	9. 2	·1419					
14. 2	11. 5	9. 17	·1412					
14. 13	7. 0	9. 29	·1419					
14. 26	5. 45	9. 42	·1423					
14. 32	5. 30	9. 51	·1421					
14. 40	4. 20	10. 0	·1417					
14. 57	5. 35	10. 11	·1416					
15. 10	9. 15	10. 38	·1400					
15. 31	11. 25	10. 50	·1410					
15. 58	7. 25	11. 10	·1407					
16. 12	6. 5	11. 20	·1411					
16. 19	6. 40	11. 29	·1404					
16. 30	6. 50	11. 38	·1402					
16. 40	6. 20	11. 49	·1411					
16. 50	7. 0	12. 0	·1395					
17. 0	6. 50	12. 17	·1403					
17. 20	8. 25	12. 21	·1414					
17. 28	8. 20	12. 29	·1420					
17. 59	10. 20	12. 32	·1416					
18. 21	10. 35	12. 40	·1422					
18. 30	10. 0	12. 43	·1419					
18. 59	11. 15	13. 2	·1424					
19. 22	10. 0	13. 21	·1422					
19. 37	10. 55	13. 37	·1411					
19. 42	10. 50	13. 48	·1412					
19. 47	10. 55	13. 59	·1427					
19. 55	10. 15	14. 10	·1428					
20. 0	10. 45	14. 40	·1412					
20. 10	9. 20	14. 53	·1413					
20. 23	10. 25	15. 7	·1407					
20. 35	10. 40	15. 18	·1409					
20. 45	11. 45	15. 23	·1412					
20. 51	11. 50	15. 32	·1409					
20. 58	12. 10	15. 40	·1412					
21. 27	12. 0	15. 59	·1409					
22. 35	13. 10	16. 7	·1411					
22. 53	15. 10	16. 18	·1407					
23. 0	14. 20	16. 30	·1414					
23. 3	14. 55	16. 52	·1416					
23. 12	14. 45	17. 13	·1415					
23. 22	16. 0	17. 58	·1416					
23. 32	17. 50	18. 24	·1411					
23. 37	17. 40	18. 45	·1413					
23. 44	19. 20	19. 0	·1410					
23. 52	19. 40		***					
23. 59	20. 30	19. 42	·1413					
		20. 8	·1408					
		20. 19	·1411					
		20. 41	·1410					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H.F. Magnet.	Of V. F. Magnet.
		Mar.30						
h m	° ′ ″	h m		h m		h m	°	°
		21. 22	·1404					
		21. 30	·1406					
		22. 0	·1403					
		22. 23	·1403					
		22. 32	·1402					
		22. 50	·1407					
		22. 57	·1401					
		23. 29	·1408					
		23. 32	·1406					
		23. 40	·1413					
		23. 48	·1409					
			(†)					
Apr. 1		Apr. 1		Apr. 1		Apr. 1		
0. 0	20. 19. 0	0. 0	·1417	0. 0	·02373	0. 0	60·7	61·1
0. 12	19. 25	0. 10	·1418	0. 57	·02392	1. 0	60·8	61·1
0. 23	20. 55	0. 24	·1422	1. 27	·02428	2. 0	60·8	61·1
0. 34	19. 55	0. 39	·1414	1. 50	·02427	3. 0	60·7	61·1
0. 43	19. 55	0. 48	·1417	2. 7	·02435	6. 0	60·7	61·1
0. 53	18. 10	0. 57	·1413	2. 15	·02422	9. 0	60·7	61·5
1. 2	18. 20	1. 11	·1425	3. 59	·02468	21. 0	60·7	61·0
1. 12	21. 10	1. 31	·1435	4. 32	·02465	22. 0	60·7	60·7
1. 25	22. 50	1. 40	·1428	4. 47	·02478	23. 0	60·6	60·8
1. 37	22. 15	1. 43	·1431	5. 4	·02485			
1. 42	23. 0	1. 52	·1427	5. 46	·02470			
1. 51	22. 50	2. 3	·1432	6. 17	·02472			
2. 2	24. 20	2. 13	·1422	7. 29	·02463			
2. 22	21. 30	2. 22	·1415	8. 30	·02465			
2. 32	21. 50	2. 39	·1416	8. 45	·02473			
3. 2	20. 10	2. 48	·1421	9. 5	·02458			
3. 9	20. 25	2. 52	·1419	9. 57	·02479			
3. 22	19. 50	3. 2	·1422	10. 8	·02470			
3. 39	20. 20	3. 20	·1423	10. 50	·02482			
3. 49	20. 10	3. 22	·1421	11. 17	·02445			
3. 57	20. 45	3. 30	·1423	11. 21	·02440			
4. 19	20. 20	3. 33	·1422	11. 29	·02420			
4. 29	19. 30	3. 57	·1430	11. 42	·02418			
4. 39	19. 30	4. 13	·1428	12. 2	·02450			
4. 45	19. 55	4. 38	·1422	12. 38	·02450			
5. 12	18. 20	4. 48	·1428	12. 56	·02438			
5. 32	17. 55	4. 58	·1425	13. 13	·02443			
5. 48	17. 5	5. 3	·1428	13. 51	·02411			
6. 22	17. 5	5. 30	·1416	14. 7	·02370			
6. 38	15. 40	5. 43	·1415	14. 20	·02342			
7. 2	15. 45	5. 57	·1424	14. 32	·02350			
7. 12	15. 0	6. 15	·1431	14. 51	·02390			
7. 51	16. 0	6. 37	·1427	15. 18	·02407			
8. 0	15. 45	6. 50	·1421	15. 47	·02390			
8. 30	15. 50	7. 12	·1423	15. 58	·02397			
8. 32	16. 25	7. 43	·1430	16. 18	·02350			
8. 40	16. 25	8. 13	·1425	16. 29	·02345			
8. 44	17. 5	8. 33	·1426	16. 59	·02250			
9. 4	17. 10	8. 49	·1445	17. 4	·02251			
9. 13	16. 40	9. 2	·1443	17. 8	·02244			
9. 27	17. 0	9. 12	·1434	17. 17	·02253			
9. 39	15. 0	9. 20	·1430	17. 27	·02245			
9. 50	12. 50	9. 32	·1425	17. 34	·02254			
10. 2	16. 10	9. 38	·1429	17. 40	·02249			

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Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Apr. 1		Apr. 1		Apr. 1				
h m	° ′ ″	h m		h m		h m	°	°
10. 13	20. 14. 45	9. 41	·1426	17. 58	·02263			
10. 21	12. 30	10. 1	·1437	18. 14	·02275			
10. 31	11. 40	10. 20	·1423	18. 33	·02304			
10. 46	9. 0	10. 29	·1420	19. 3	·02355			
10. 49	9. 20	10. 40	·1412	19. 29	·02363			
11. 0	20. 1. 40	10. 51	·1412	19. 50	·02367			
11. 6	19. 57. 25	11. 9	·1427	20. 27	·02380			
11. 7	57. 50	11. 17	·1419	20. 31	·02367			
11. 13	56. 0	11. 30	·1393	20. 46	·02380			
11. 22	19. 57. 20	11. 41	·1399	22. 18	·02370			
11. 32	20. 10. 20	11. 52	·1395	22. 27	·02374			
11. 38	10. 0	12. 11	·1410	22. 35	·02363			
11. 42	10. 45	12. 49	·1412	22. 39	·02368			
12. 5	3. 45	13. 18	·1406	22. 46	·02358			
12. 17	2. 45	13. 42	·1396	22. 50	·02366			
12. 23	2. 0	14. 5	·1431	23. 16	·02360			
12. 31	2. 20	14. 33	·1411	23. 48	·02360			
12. 44	1. 55	14. 57	·1420	23. 59	·02375			
12. 56	20. 0. 50	15. 19	·1421					
13. 0	19. 59. 55	15. 27	·1418					
13. 13	20. 0. 50	15. 40	·1422					
13. 23	1. 45	15. 49	·1418					
13. 32	4. 0	16. 3	·1418					
13. 40	4. 10	16. 18	·1413					
13. 52	14. 50	16. 39	·1444					
14. 0	14. 30	16. 49	·1443					
14. 9	8. 55	16. 58	·1436					
14. 18	7. 20	17. 5	·1443					
14. 28	1. 50	17. 11	·1444					
14. 32	20. 1. 35	17. 27	·1428					
14. 41	19. 59. 0	17. 32	·1425					
14. 51	19. 59. 55	17. 40	·1412					
15. 5	20. 2. 55	17. 47	·1416					
15. 26	5. 35	17. 52	·1416					
15. 31	4. 25	17. 57	·1414					
15. 49	3. 10	18. 4	·1419					
15. 52	2. 5	18. 12	·1413					
16. 15	11. 55	18. 20	·1411					
16. 21	12. 55	18. 30	·1413					
16. 46	21. 20	18. 37	·1409					
17. 5	12. 45	18. 56	·1396					
17. 16	12. 0	19. 12	·1400					
17. 25	15. 30	19. 43	·1402					
17. 35	16. 10	19. 52	·1403					
17. 42	17. 50	20. 2	·1401					
17. 49	14. 15	20. 5	·1402					
17. 59	11. 45	20. 15	·1395					
18. 6	8. 20	20. 21	·1401					
18. 20	6. 35	20. 42	·1400					
18. 29	5. 0	20. 52	·1404					
18. 37	4. 55	21. 20	·1405					
18. 42	6. 15	21. 27	·1407					
18. 47	9. 30	21. 33	·1402					
19. 1	10. 40	21. 42	·1406					
19. 6	9. 20	21. 48	·1404					
19. 12	10. 45	22. 7	·1408					
19. 26	11. 10	22. 11	·1406					
19. 31	10. 40	22. 17	·1411					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Apr. 1		Apr. 1						
h m	° ′ ″	h m		h m		h m	°	°
19. 34	20. 11. 35	22. 19	·1409					
19. 39	10. 40	22. 28	·1415					
19. 56	12. 10	22. 31	·1409					
20. 0	11. 40	22. 37	·1407					
20. 10	12. 35	22. 40	·1418					
20. 17	10. 50	22. 42	·1408					
20. 22	12. 55	22. 49	·1416					
20. 27	14. 25	22. 58	·1413					
20. 31	8. 40	23. 0	·1415					
20. 37	12. 0	23. 3	·1417					
20. 45	12. 40	23. 15	·1412					
20. 49	12. 15	23. 26	·1409					
20. 52	12. 55	23. 31	·1411					
21. 0	12. 40	23. 41	·1406					
21. 16	13. 50	23. 53	·1416					
21. 21	13. 30	23. 57	·1411					
21. 29	15. 0	23. 59	·1418					
21. 39	14. 10							
21. 43	15. 0							
21. 50	14. 25							
21. 57	15. 15							
22. 3	14. 35							
22. 7	15. 35							
22. 12	14. 30							
22. 17	15. 40							
22. 22	16. 0							
22. 24	17. 35							
22. 34	16. 20							
22. 38	18. 30							
22. 45	17. 15							
22. 49	18. 50							
23. 2	19. 20							
23. 9	20. 50							
23. 11	20. 40							
23. 13	21. 10							
23. 22	20. 55							
23. 30	22. 0							
23. 39	21. 15							
23. 42	22. 45							
23. 52	23. 55							
23. 59	23. 30							
Apr. 2		Apr. 2		Apr. 2		Apr. 2		
0. 0	20. 23. 30	0. 0	·1418	0. 0	·02375	0. 0	60 ·5	60 ·9
0. 5	25. 10	0. 3	·1422	0. 15	·02375	1. 0	60 ·5	60 ·7
0. 11	25. 50	0. 10	·1419	0. 25	·02392	2. 0	60 ·4	60 ·6
0. 18	27. 20	0. 18	·1426	0. 30	·02382	3. 0	60 ·3	60 ·5
0. 22	26. 45	0. 27	·1417	0. 49	·02385	6. 0	60 ·6	60 ·8
0. 27	28. 5	0. 38	·1414	0. 58	·02413	9. 0	60 ·2	60 ·5
0. 37	29. 40	0. 42	·1409	1. 4	·02386	21. 0	60 ·0	60 ·0
0. 39	29. 10	0. 50	·1422	1. 7	·02400	22. 0	60 ·2	60 ·5
0. 46	32. 55	0. 56	·1401	1. 10	·02382	23. 0	60 ·4	60 ·9
0. 52	30. 45	1. 0	·1396	1. 19	·02420			
0. 53	31. 10	1. 2	·1376	1. 25	·02403			
1. 0	29. 0	1. 5	·1384	1. 29	·02435			
1. 7	30. 55	1. 11	·1384	1. 32	·02412			
1. 17	28. 5	1. 18	·1371	1. 41	·02442			
1. 19	30. 40	1. 20	·1382	1. 47	·02430			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.	Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Apr. 2		Apr. 2		Apr. 2					Apr. 2		Apr. 2						
h m	° ′ ″	h m		h m		h m	°	°	h m	° ′ ″	h m		h m		h m	°	°
1. 25	20. 28. 25	1. 26	·1370	1. 55	·02452				7. 17	20. 16. 30	8. 37	·1401					
1. 29	31. 20	1. 32	·1385	2. 10	·02470				7. 24	16. 55	9. 0	·1412					
1. 37	29. 40	1. 36	·1381	2. 28	·02475				7. 50	15. 50	9. 10	·1402					
1. 40	31. 20	1. 42	·1396	2. 32	·02490				7. 58	16. 5	9. 30	·1413					
1. 47	29. 50	1. 48	·1393	2. 40	·02485				8. 12	14. 0	9. 38	·1409					
1. 51	31. 5	1. 52	·1408	2. 47	·02512				8. 22	11. 20	9. 46	·1411					
1. 55	31. 20	1. 56	·1407	3. 5	·02550				8. 30	11. 20	9. 52	·1420					
1. 59	33. 25	2. 2	·1412	3. 22	·02640				8. 38	11. 0	10. 12	·1407					
2. 9	35. 20	2. 12	·1414	3. 47	·02677				8. 57	13. 40	10. 20	·1411					
2. 16	32. 50	2. 17	·1410	4. 47	·02598				9. 17	9. 20	10. 30	·1409					
2. 19	34. 0	2. 21	·1415	5. 38	·02521				9. 24	11. 0	10. 37	·1403					
2. 24	34. 0	2. 30	·1408	6. 2	·02512				9. 31	14. 50	10. 40	·1405					
2. 30	33. 10	2. 37	·1426	6. 20	·02492				9. 38	14. 50	10. 52	·1397					
2. 33	37. 10	2. 40	·1422	6. 51	·02490				9. 41	13. 15	11. 10	·1405					
2. 39	35. 40	2. 42	·1428	7. 31	·02480				9. 52	12. 55	11. 20	·1427					
2. 42	36. 40	2. 47	·1423	7. 59	·02489				9. 58	13. 15	11. 32	·1430					
2. 48	33. 55	2. 51	·1432	8. 19	·02480				10. 12	9. 15	11. 40	·1422					
2. 50	34. 30	2. 54	·1432	8. 47	·02513				10. 25	8. 20	11. 48	·1419					
2. 52	33. 10	2. 58	·1439	9. 42	·02465				10. 37	11. 20	11. 57	·1423					
2. 54	35. 50	3. 4	·1423	10. 8	·02420				10. 55	16. 50	12. 3	·1423					
3. 5	30. 15	3. 9	·1433	11. 15	·02437				11. 3	16. 40	12. 18	·1419					
3. 9	31. 50	3. 13	·1411	11. 33	·02400				11. 14	18. 35	12. 23	·1421					
3. 10	31. 20	3. 19	·1433	11. 50	·02358				11. 32	26. 45	12. 38	·1419					
3. 12	34. 0	3. 22	·1431	12. 20	·02370				11. 52	16. 45	12. 47	·1420					
3. 16	32. 35	3. 30	·1463	12. 47	·02390				12. 2	13. 40	12. 59	·1416					
3. 18	33. 50	3. 37	·1438	13. 17	·02380				12. 10	14. 40	13. 9	·1418					
3. 20	32. 40	3. 41	·1461	13. 57	·02396				12. 19	14. 10	13. 22	·1415					
3. 22	33. 25	3. 46	·1443	15. 0	·02400				12. 40	18. 20	13. 48	·1413					
3. 28	39. 10	3. 48	·1453	16. 24	·02400				12. 51	18. 20	13. 57	·1416					
3. 35	29. 35	3. 57	·1442	17. 30	·02397				13. 3	16. 5	14. 17	·1414					
3. 38	30. 50	4. 2	·1383	18. 40	·02400				13. 12	16. 0	14. 29	·1416					
3. 43	22. 5	4. 12	·1377	21. 5	·02370				13. 23	14. 50	14. 40	·1414					
3. 47	28. 55	4. 22	·1387	23. 10	·02370				13. 33	14. 20	14. 52	·1416					
3. 49	26. 25	4. 28	·1396	23. 59	·02380				13. 40	15. 5	15. 1	·1414					
3. 50	34. 10	4. 32	·1399						14. 4	13. 55	15. 38	·1418					
3. 52	33. 20	4. 42	·1426						14. 10	14. 5	15. 50	·1416					
4. 0	40. 0	4. 52	·1412						14. 18	13. 45	16. 3	·1418					
4. 10	28. 45	5. 7	·1406						14. 31	13. 50	16. 20	·1416					
4. 13	25. 55	5. 17	·1412						14. 37	13. 20	16. 30	·1417					
4. 27	24. 20	5. 32	·1413						14. 52	13. 50	16. 50	·1415					
4. 35	24. 50	5. 37	·1409						15. 7	13. 0	17. 7	·1420					
4. 39	25. 50	5. 47	·1416						15. 12	13. 55	17. 18	·1418					
4. 46	24. 20	5. 57	·1412						15. 20	13. 30	17. 52	·1419					
4. 51	24. 35	6. 9	·1416						15. 36	13. 50	17. 59	·1421					
4. 53	23. 45	6. 19	·1408						15. 43	13. 0	18. 10	·1416					
5. 1	23. 35	6. 23	·1405						16. 3	13. 40	18. 21	·1420					
5. 7	22. 40	6. 33	·1409						16. 16	13. 35	18. 29	·1418					
5. 22	22. 45	6. 42	·1408						16. 20	13. 0	18. 52	·1418					
5. 30	22. 0	6. 49	·1413						16. 40	14. 0		***					
5. 36	21. 0	6. 59	·1416						16. 50	13. 30	19. 16	·1416					
5. 48	20. 40	7. 11	·1413						17. 3	13. 55	19. 42	·1414					
5. 58	18. 30	7. 20	·1406						17. 20	13. 20	19. 57	·1410					
6. 7	18. 25	7. 32	·1405						17. 30	14. 10	20. 2	·1412					
6. 20	20. 15	7. 42	·1412						17. 37	13. 20	20. 10	·1408					
6. 33	18. 40	7. 57	·1408						17. 51	12. 40	20. 51	·1408					
6. 42	15. 0	8. 2	·1411						17. 56	13. 50	20. 59	·1403					
6. 57	15. 15	8. 11	·1411						18. 8	12. 0	21. 18	·1406					
7. 6	17. 5	8. 26	·1401						18. 15	13. 5	21. 49	·1399					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Apr. 2		Apr. 2						
h m	° ′ ″	h m		h m		h m	°	°
18. 20	20. 12. 0	22. 19	·1403					
18. 26	12. 55	22. 38	·1394					
18. 32	12. 0	22. 42	·1398					
18. 43	12. 15	22. 57	·1387					
18. 49	11. 10	23. 0	·1390					
18. 51	12. 5	23. 40	·1406					
18. 58	10. 25	23. 59	·1409					
19. 2	12. 40							
19. 5	11. 20							
19. 12	10. 25							
19. 18	11. 40							
19. 23	10. 0							
19. 32	11. 15							
19. 35	11. 55							
19. 45	11. 15							
19. 50	12. 10							
19. 52	10. 20							
19. 57	11. 40							
20. 2	10. 20							
20. 9	11. 0							
20. 12	10. 5							
20. 23	10. 40							
20. 40	10. 20							
20. 42	11. 0							
20. 53	10. 55							
20. 58	11. 30							
21. 3	8. 50							
21. 12	11. 10							
21. 19	11. 20							
21. 25	12. 10							
21. 48	12. 50							
21. 57	12. 40							
22. 19	14. 25							
22. 36	15. 30							
22. 40	15. 5							
22. 48	16. 30							
22. 55	15. 45							
23. 2	15. 25							
23. 8	15. 50							
23. 20	17. 20							
23. 37	18. 50							
23. 59	19. 20							
Apr. 19		Apr. 19		Apr. 19		Apr. 19		
0. 0	20. 28. 30	0. 0	·1404	0. 0	·02034*	0. 0	60·1	60·3
0. 3	27. 45	0. 8	·1395	8. 30	·02255*	8. 30	60·6	60·9
0. 17	28. 10	0. 20	·1404	21. 0	·02088*	11. 0	59·9	59·9
0. 22	28. 20	0. 26	·1402			21. 0	60·4	60·0
0. 37	28. 10	0. 32	·1406			22. 0	60·4	60·2
0. 46	27. 20	0. 39	·1406			23. 0	60·5	60·6
0. 55	28. 45	0. 42	·1401					
1. 3	27. 40	0. 53	·1410					
1. 21	27. 55	1. 0	·1408					
1. 28	29. 5	1. 9	·1412					
1. 39	29. 0	1. 11	·1410					
1. 47	31. 0	1. 26	·1420					
2. 7	30. 0	1. 34	·1415					
2. 22	30. 35	1. 43	·1423					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Apr. 19		Apr. 19						
h m	° ′ ″	h m		h m		h m	°	°
2. 33	20. 30. 25	1. 48	·1421					
2. 50	28. 10	1. 52	·1423					
3. 1	29. 0	1. 59	·1429					
3. 18	25. 30	2. 2	·1426					
3. 29	27. 30	2. 12	·1431					
3. 39	24. 55	2. 29	·1421					
3. 47	26. 5	2. 32	·1423					
3. 57	26. 55	2. 38	·1419					
4. 8	23. 10	2. 59	·1449					
4. 17	22. 35	3. 10	·1432					
4. 26	23. 20	3. 13	·1430					
4. 29	22. 15	3. 26	·1438					
4. 32	22. 50	3. 32	·1434					
4. 42	20. 15	3. 43	·1444					
4. 49	21. 10	3. 48	·1440					
4. 59	19. 5	3. 52	·1443					
5. 7	21. 15	3. 58	·1435					
5. 12	21. 45	4. 1	·1441					
5. 18	19. 0	4. 7	·1441					
5. 29	9. 0	4. 17	·1431					
5. 38	19. 30	4. 22	·1427					
5. 47	19. 0	4. 28	·1423					
5. 51	20. 20	4. 30	·1426					
6. 0	15. 30	4. 32	·1422					
6. 2	16. 30	4. 38	·1424					
6. 10	11. 40	4. 48	·1441					
6. 22	12. 10	4. 50	·1439					
6. 35	13. 20	5. 3	·1453					
6. 48	28. 50	5. 10	·1447					
7. 11	9. 10	5. 18	·1431					
7. 20	8. 25	5. 22	·1439					
7. 29	9. 20	5. 32	·1482					
7. 39	6. 0	5. 40	·1450					
7. 49	7. 0	5. 42	·1443					
7. 59	10. 40	5. 48	·1446					
8. 40	1. 0	5. 54	·1434					
8. 48	1. 5	6. 2	·1444					
8. 57	9. 15	6. 5	·1437					
9. 3	8. 25	6. 12	·1447					
9. 13	15. 55	6. 20	·1454					
9. 21	15. 10	6. 22	·1453					
9. 26	13. 25	6. 38	·1474					
9. 32	13. 20	6. 42	·1463					
9. 38	12. 45	6. 50	·1430					
9. 47	12. 50	6. 53	·1426					
9. 52	13. 40	6. 57	·1418					
10. 1	13. 0	7. 2	·1420					
10. 20	12. 40	7. 7	·1417					
10. 29	12. 0	7. 16	·1423					
10. 30	11. 0	7. 21	·1417					
10. 36	10. 40	7. 25	·1419					
10. 42	8. 5	7. 28	·1416					
10. 57	6. 40	7. 34	·1422					
11. 0	5. 5	7. 50	·1426					
11. 10	6. 10	8. 12	·1408					
11. 18	4. 15	8. 22	·1422					
11. 22	3. 40	8. 24	·1420					
11. 43	10. 15	8. 32	·1429					

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

April 19 and 27. There were no photographic registers for Vertical Force, the apparatus being away for alteration.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Apr. 19		Apr. 19						
h m	° ′ ″	h m		h m		h m	°	°
11. 51	20. 9. 20	8. 45	·1416					
12. 2	9. 0	8. 52	·1423					
12. 18	10. 0	9. 2	·1412					
12. 39	7. 0	9. 8	·1414					
12. 47	7. 20	9. 10	·1411					
12. 53	9. 15	9. 14	·1414					
13. 3	12. 50	9. 28	·1414					
13. 11	17. 25	9. 32	·1418					
13. 17	18. 20	9. 38	·1416					
13. 25	21. 10	9. 46	·1416					
13. 42	14. 55	9. 57	·1411					
13. 47	15. 0	10. 3	·1418					
13. 52	15. 50	10. 7	·1415					
14. 3	15. 30	10. 16	·1419					
14. 18	6. 55	10. 21	·1414					
14. 37	17. 20	10. 35	·1416					
14. 40	8. 0	10. 42	·1405					
14. 56	6. 20	10. 47	·1407					
15. 7	6. 20	10. 57	·1399					
15. 11	6. 40	11. 8	·1407					
15. 39	6. 0	11. 17	·1416					
16. 0	10. 0	11. 39	·1407					
16. 5	10. 0	11. 58	·1413					
16. 12	10. 45	12. 7	·1409					
16. 26	9. 25	12. 23	·1405					
16. 49	8. 25	12. 30	·1405					
17. 4	8. 30	12. 42	·1401					
17. 20	7. 10	12. 48	·1405					
17. 34	7. 40	12. 52	·1420					
17. 46	10. 40	12. 58	·1436					
17. 59	11. 20	13. 2	·1441					
18. 2	10. 45	13. 20	·1424					
18. 10	11. 40	13. 31	·1432					
18. 29	9. 25	13. 53	·1411					
18. 37	10. 25	14. 8	·1426					
18. 40	11. 25	14. 12	·1429					
18. 45	10. 40	14. 28	·1415					
18. 55	10. 50	14. 34	·1404					
19. 1	10. 0	15. 10	·1408					
19. 14	9. 35	15. 17	·1406					
19. 20	10. 20	15. 27	·1410					
19. 40	9. 45	15. 33	·1407					
19. 48	10. 30	16. 10	·1407					
19. 56	9. 55	16. 22	·1409					
20. 16	11. 10	16. 30	·1407					
20. 22	12. 15	16. 41	·1410					
20. 40	13. 10	17. 1	·1406					
20. 46	12. 0	17. 4	·1404					
20. 52	12. 55	17. 22	·1411					
21. 5	11. 5	17. 38	·1409					
21. 29	11. 40	17. 44	·1405					
21. 37	10. 20	17. 53	·1410					
21. 48	11. 25	18. 8	·1408					
21. 58	11. 30	18. 14	·1414					
22. 9	12. 30	18. 22	·1419					
22. 19	12. 15	18. 28	·1413					
22. 33	13. 55	18. 37	·1418					
22. 52	13. 40	18. 40	·1410					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Apr. 19		Apr. 19						
h m	° ′ ″	h m		h m		h m	°	°
22. 59	20. 14. 20	18. 57	·1410					
23. 12	15. 50	19. 2	·1413					
23. 22	15. 50	19. 30	·1410					
23. 24	16. 45	19. 50	·1403					
23. 59	17. 30	20. 0	·1403					
		20. 10	·1397					
		20. 37	·1401					
		20. 48	·1400					
		20. 53	·1397					
		21. 12	·1405					
		21. 22	·1405					
		21. 30	·1401					
		21. 40	·1408					
		21. 48	·1406					
		22. 2	·1408					
		22. 17	·1405					
		22. 25	·1406					
		22. 41	·1400					
		22. 47	·1404					
		22. 52	·1402					
		23. 0	·1406					
		23. 19	·1403					
		23. 32	·1404					
		23. 59	·1407					
Apr. 27		Apr. 27		Apr. 27		Apr. 27		
0. 0	20. 22. 25	0. 0	·1418	1. 0	·02024*	0. 0	60·4	60·4
0. 14	23. 40	0. 17	·1422	3. 0	·02073*	1. 0	60·4	60·5
0. 32	23. 40	0. 22	·1422	9. 0	·02135*	2. 0	60·5	60·5
0. 40	25. 15	0. 40	·1431	21. 0	·02069*	3. 0	60·0	60·1
0. 54	25. 20	0. 50	·1430			6. 0	60·5	60·7
1. 32	26. 0	1. 0	·1434			9. 0	60·5	60·5
2. 9	24. 30	1. 11	·1436			21. 0	60·3	59·8
2. 37	23. 50	1. 13	·1434			22. 0	60·3	60·2
2. 40	25. 25	1. 33	·1438			23. 0	60·4	60·6
3. 2	24. 50	1. 50	·1434					
3. 13	26. 20	1. 59	·1436					
3. 40	25. 55	2. 7	·1432					
3. 52	26. 50	2. 13	·1436					
4. 3	25. 25	2. 27	·1437					
4. 12	25. 25	2. 32	·1435					
4. 16	24. 10	2. 42	·1448					
4. 28	24. 25	2. 53	·1440					
4. 33	23. 15	3. 1	·1437					
4. 43	23. 10	3. 12	·1448					
4. 52	22. 25	3. 26	·1438					
5. 2	23. 20	3. 42	·1429					
5. 12	24. 10	3. 50	·1435					
5. 18	22. 20	3. 58	·1435					
5. 30	26. 45	4. 2	·1431					
5. 40	24. 10	4. 8	·1434					
5. 52	24. 55	4. 12	·1432					
5. 57	23. 25	4. 25	·1450					
6. 3	23. 20	4. 34	·1441					
6. 12	20. 10	4. 35	·1443					
6. 28	17. 30	4. 45	·1427					
6. 33	18. 30	4. 53	·1451					
6. 49	14. 20	4. 59	·1448					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Apr. 27		Apr. 27						
h m	° ′ ″	h m		h m		h m	°	°
6. 57	20. 14. 55	5. 2	·1452					
7. 6	12. 20	5. 4	·1462					
7. 12	5. 20	5. 10	·1468					
7. 14	20. 5. 45	5. 16	·1455					
7. 27	19. 54. 35	5. 20	·1461					
7. 39	57. 25	5. 25	·1492					
7. 47	19. 56. 15	5. 38	·1459					
7. 59	20. 1. 25	5. 41	·1456					
8. 9	19. 59. 50	5. 45	·1459					
8. 25	20. 4. 20	5. 52	·1437					
8. 32	1. 55	6. 12	·1457					
8. 45	1. 15	6. 30	·1426					
8. 56	1. 20	6. 38	·1433					
9. 2	2. 5	6. 41	·1429					
9. 12	0. 45	6. 42	·1432					
9. 29	20. 0. 25	6. 51	·1424					
9. 40	19. 59. 5	7. 0	·1411					
9. 50	59. 40	7. 13	·1416					
9. 59	19. 58. 20	7. 23	·1424					
10. 7	20. 1. 10	7. 37	·1413					
10. 25	20. 3. 20	7. 43	·1418					
10. 39	19. 50. 55	7. 59	·1400					
10. 48	54. 45	8. 12	·1394					
11. 2	49. 35	8. 22	·1382					
11. 12	51. 30	8. 29	·1383					
11. 20	51. 35	8. 38	·1377					
11. 29	55. 20	8. 53	·1384					
11. 37	45. 20	9. 2	·1378					
11. 49	56. 15	9. 17	·1376					
11. 58	19. 57. 10	9. 31	·1367					
12. 9	20. 2. 55	9. 42	·1363					
12. 19	1. 20	10. 0	·1375					
12. 32	3. 5	10. 12	·1352					
12. 39	2. 50	10. 22	·1355					
12. 47	5. 10	10. 33	·1344					
12. 52	7. 55		(†)					
13. 9	6. 50	10. 52	·1346					
13. 18	7. 45	11. 0	·1359					
13. 28	7. 20	11. 2	·1356					
13. 37	9. 0	11. 12	·1373					
13. 46	7. 0	11. 14	·1371					
13. 53	7. 0	11. 23	·1374					
13. 59	6. 5	11. 32	·1402					
14. 10	6. 25	11. 37	·1407					
14. 22	5. 30	11. 50	·1372					
14. 35	7. 25	12. 1	·1375					
15. 18	8. 0	12. 17	·1398					
15. 29	10. 0	12. 48	·1394					
15. 41	10. 40	12. 51	·1391					
15. 49	11. 10	13. 5	·1406					
16. 3	11. 0	13. 19	·1414					
16. 9	9. 40	13. 28	·1415					
16. 16	10. 5	13. 37	·1409					
16. 26	8. 25	13. 43	·1411					
16. 31	10. 55	13. 52	·1411					
17. 0	10. 25	14. 4	·1408					
17. 16	11. 30	14. 22	·1408					
17. 39	11. 35	14. 31	·1403					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Apr. 27		Apr. 27						
h m	° ′ ″	h m		h m		h m	°	°
17. 47	20. 10. 0	14. 37	·1405					
17. 57	10. 45	14. 42	·1403					
18. 17	8. 30	14. 52	·1405					
18. 22	9. 45	15. 2	·1403					
18. 31	9. 0	15. 18	·1408					
18. 40	11. 45	15. 26	·1406					
18. 52	8. 15	15. 37	·1408					
19. 2	10. 30	15. 44	·1405					
19. 7	10. 45	15. 56	·1408					
19. 9	13. 0	16. 0	·1405					
19. 21	10. 20	16. 9	·1410					
19. 52	10. 0	16. 12	·1406					
20. 0	11. 10	16. 22	·1412					
20. 9	10. 55	16. 30	·1408					
20. 37	11. 30	17. 14	·1408					
20. 43	11. 0	17. 22	·1407					
21. 36	13. 15	17. 32	·1408					
21. 48	13. 0	17. 41	·1405					
21. 54	13. 40	17. 52	·1412					
22. 8	13. 30	17. 58	·1409					
22. 47	16. 5	18. 0	·1411					
23. 4	16. 40	18. 12	·1410					
23. 22	17. 55	18. 17	·1415					
23. 38	17. 55	18. 20	·1413					
23. 59	19. 25	18. 29	·1414					
		18. 32	·1418					
		18. 46	·1407					
		18. 57	·1413					
		19. 0	·1410					
		19. 3	·1412					
		19. 10	·1406					
		19. 19	·1402					
		19. 57	·1403					
		20. 8	·1399					
		20. 16	·1401					
		20. 22	·1399					
		20. 30	·1401					
		20. 40	·1398					
		20. 56	·1397					
		21. 0	·1396					
		21. 48	·1391					
		22. 59	·1395					
		23. 30	·1399					
		23. 59	·1403					
Apr. 29		Apr. 29		Apr. 29		Apr. 29		
0. 0	20. 19. 40	0. 0	·1402		(†)	0. 0	61 ·3	61 ·0
0. 34	21. 35	0. 4	·1406	0. 22	·02168	1. 0	61 ·2	61 ·0
0. 40	21. 15	0. 21	·1407	1. 8	·02160	2. 0	61 ·1	60 ·9
1. 5	23. 15	0. 42	·1403	2. 5	·02170	3. 0	61 ·1	60 ·9
1. 29	23. 25	0. 57	·1405	2. 48	·02177	5. 0	61 ·0	60 ·7
1. 35	22. 50	1. 4	·1410	3. 46	·02197	6. 0	60 ·9	60 ·9
1. 41	23. 10	1. 13	·1409	3. 59	·02190	8. 0	61 ·1	61 ·1
1. 48	22. 45	1. 34	·1415	4. 28	·02212	9. 0	60 ·8	61 ·0
1. 56	23. 10	1. 40	·1414	4. 50	·02210	11. 0	61 ·0	61 ·4
2. 3	22. 45	1. 47	·1415	5. 33	·02241	21. 0	60 ·7	60 ·9
2. 22	24. 0	1. 52	·1414	5. 48	·02240	22. 0	61 ·5	61 ·1
2. 33	23. 10	1. 59	·1415	5. 56	·02252	23. 0	61 ·7	61 ·9

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

April 27. The photographic trace for Horizontal Force was off the sheet in the direction of *diminishing* force from 10^h. 33^m. to 10^h. 52^m.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Apr. 29 h m	° ′ ″	Apr. 29 h m		Apr. 29 h m		h m	°	°
2. 39	20. 23. 20	2. 2	·1417	6. 8	·02229			
2. 47	23. 0	2. 5	·1415	6. 24	·02229			
2. 58	23. 35	2. 18	·1417	6. 40	·02217			
3. 3	24. 40	2. 23	·1423	6. 57	·02239			
3. 20	23. 45	2. 33	·1423	7. 19	·02230			
3. 48	23. 50	2. 52	·1419	7. 33	·02240			
4. 10	22. 40	3. 2	·1423	7. 50	·02230			
4. 27	22. 15	3. 8	·1432	8. 30	·02236			
4. 49	22. 45	3. 22	·1422	8. 45	·02224			
4. 57	22. 20	3. 45	·1426	9. 8	·02227			
5. 13	22. 30	3. 52	·1428	9. 18	·02207			
5. 30	18. 45	4. 10	·1424	9. 26	·02203			
5. 38	19. 30	4. 33	·1437	9. 38	·02190			
5. 42	19. 25	4. 51	·1440	9. 49	·02200			
5. 49	20. 55	5. 3	·1432	10. 5	·02153			
5. 53	19. 10	5. 18	·1431	10. 15	·02151			
5. 57	16. 50	5. 24	·1435	10. 22	·02137			
6. 2	19. 30	5. 32	·1433	10. 30	·02115			
6. 12	13. 10	5. 42	·1446	10. 41	·02083			
6. 36	17. 10	5. 44	·1444	10. 47	·02093			
6. 42	14. 50	5. 53	·1453	10. 58	·02074			
6. 51	11. 45	5. 59	·1449	11. 5	·02091			
7. 2	14. 40	6. 3	·1464	11. 8	·02083			
7. 9	15. 0	6. 12	·1448	11. 15	·02090			
7. 15	13. 50	6. 22	·1456	11. 34	·02122			
7. 30	10. 20	6. 48	·1426	11. 50	·02095			
7. 46	13. 55	7. 1	·1435	11. 58	·02095			
7. 57	11. 50	7. 13	·1432	12. 8	·02060			
8. 3	12. 5	7. 28	·1419	12. 19	·02038			
8. 15	11. 30	7. 40	·1429	12. 28	·02028			
8. 20	12. 20	7. 58	·1415	12. 38	·02046			
8. 28	11. 55	8. 2	·1417	12. 49	·02035			
8. 39	10. 20	8. 8	·1414	12. 57	·02061			
9. 0	5. 35	8. 14	·1416	13. 3	·02040			
9. 22	1. 50	8. 23	·1416	13. 5	·02050			
9. 32	1. 15	8. 28	·1414	13. 13	·02030			
9. 40	2. 35	8. 31	·1416	13. 19	·02049			
9. 48	2. 5	8. 39	·1415	13. 39	·02007			
10. 2	20. 2. 50	8. 53	·1408	13. 57	·01990			
10. 13	19. 57. 0		(†)	14. 32	·02118			
10. 27	55. 20	9. 10	·1403	14. 41	·02108			
10. 32	55. 50	9. 13	·1408	14. 50	·02119			
10. 40	53. 20	9. 25	·1396	14. 57	·02107			
10. 47	54. 25	9. 32	·1399	15. 5	·02116			
10. 52	53. 45	9. 42	·1397	15. 12	·02107			
10. 57	54. 30	9. 47	·1394	15. 20	·02135			
11. 3	53. 0	10. 2	·1398	15. 40	·02150			
11. 12	51. 25	10. 19	·1379	16. 0	·02150			
11. 20	51. 45	10. 30	·1382	16. 37	·02157			
11. 33	19. 57. 40	10. 40	·1387	16. 59	·02147			
11. 52	20. 0. 55	10. 48	·1383	17. 47	·02142			
12. 2	19. 58. 25	10. 52	·1385	18. 9	·02148			
12. 4	58. 15	11. 7	·1369	18. 35	·02132			
12. 20	48. 20	11. 12	·1366	18. 46	·02138			
12. 28	47. 0	11. 20	·1377	19. 0	·02127			
12. 32	44. 50	11. 23	·1375	19. 20	·02130			
12. 41	44. 15	11. 41	·1394	19. 36	·02118			
12. 43	41. 55	11. 50	·1397	19. 46	·02116			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Apr. 29 h m	° ′ ″	Apr. 29 h m		Apr. 29 h m		h m	°	°
12. 51	19. 42. 45	11. 54	·1394	19. 56	·02117			
12. 53	42. 10	12. 10	·1386	20. 9	·02110			
13. 6	46. 45	12. 17	·1387	20. 19	·02113			
13. 10	46. 25	12. 30	·1376	20. 47	·02110			
13. 12	47. 10	12. 47	·1387	21. 5	·02100			
13. 25	45. 30	12. 57	·1383	21. 28	·02113			
13. 38	45. 10	13. 2	·1386	21. 58	·02120			
13. 45	36. 20	13. 8	·1381	22. 16	·02110			
13. 51	38. 25	13. 11	·1385	22. 30	·02125			
14. 2	39. 45	13. 17	·1385	22. 40	·02118			
14. 12	41. 40	13. 22	·1397	23. 26	·02140			
14. 17	44. 10	13. 32	·1400	23. 59	·02145			
14. 26	46. 35	13. 58	·1384					
14. 29	43. 35	14. 7	·1389					
14. 33	47. 5	14. 11	·1389					
14. 39	48. 0	14. 21	·1405					
14. 42	51. 30	14. 28	·1412					
14. 45	51. 0	14. 40	·1427					
14. 51	51. 45	14. 41	·1428					
14. 55	53. 15	15. 0	·1422					
15. 0	52. 55	15. 7	·1425					
15. 2	54. 0	15. 14	·1413					
15. 4	53. 50	15. 23	·1419					
15. 20	19. 59. 40	15. 31	·1417					
15. 32	20. 2. 20	15. 45	·1422					
15. 40	5. 30	16. 1	·1421					
15. 45	5. 10	16. 3	·1420					
15. 52	5. 40	16. 13	·1424					
15⁝57	5. 5	16. 23	·1419					
16. 1	6. 10	16. 49	·1418					
16. 3	6. 5	17. 9	·1419					
16. 9	3. 50	17. 30	·1414					
16. 16	1. 20	17. 45	·1404					
16. 20	20. 0. 20	18. 8	·1409					
16. 28	19. 59. 50	18. 19	·1408					
16. 30	20. 5. 5	18. 32	·1410					
16. 45	2. 50	18. 42	·1417					
16. 50	20. 3. 0	18. 48	·1413					
16. 59	19. 56. 50	18. 57	·1417					
17. 12	56. 10	19. 22	·1420					
17. 30	57. 25	19. 39	·1419}					
17. 38	57. 20	19. 50	·1422					
18. 0	58. 45	20. 2	·1422					
18. 2	58. 40	20. 16	·1416					
18. 16	59. 45	20. 20	·1420					
18. 27	59. 0	20. 24	·1414					
18. 34	59. 45	20. 30	·1412					
18. 46	59. 0	20. 52	·1413					
18. 56	59. 45	21. 28	·1390					
19. 0	58. 50	21. 41	·1390					
19. 17	59. 45	21. 53	·1386					
19. 40	58. 20	22. 8	·1395					
19. 46	59. 20	22. 17	·1387					
19. 49	19. 59. 0	22. 27	·1395					
20. 1	20. 0. 30	23. 10	·1398					
20. 12	19. 59. 45	23. 22	·1408					
20. 16	20. 1. 15	23. 33	·1409					
20. 21	0. 35	23. 55	·1413					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol ⁝ attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Apr. 29		Apr. 29						
h m	° ′ ″	h m		h m		h m	°	°
20. 24	20. 1. 0	23. 59	·1416					
20. 32	0. 25							
20. 42	0. 50							
20. 49	1. 20							
20. 57	0. 50							
21. 28	4. 20							
21. 32	11. 5							
21. 42	12. 20							
21. 48	12. 25							
21. 53	12. 0							
22. 2	13. 0							
22. 8	12. 30							
22. 18	12. 35							
22. 32	13. 50							
22. 36	16. 0							
22. 49	17. 20							
23. 3	17. 25							
23. 10	15. 0							
23. 17	14. 20							
23. 21	14. 55							
23. 32	22. 0							
23. 56	21. 30							
23. 59	21. 55							
June 7		June 7		June 7		June 7		
0. 0	20. 18. 30	0. 0	·1406	0. 0	·03350	0. 0	63·4	63·6
0. 20	18. 50	0. 2	·1407	1. 17	·03384	5. 0	64·1	64·2
0. 28	19. 25	0. 22	·1407	2. 47	·03410	8. 0	62·8	62·8
0. 35	19. 0	0. 29	·1411	3. 9	·03430	8. 30	62·5	62·5
1. 8	19. 50	0. 33	·1408	3. 30	·03435	21. 0	60·9	60·2
1. 32	19. 40	1. 10	·1416	3. 46	·03445	22. 0	61·1	60·4
2. 7	18. 15	1. 15	·1415	4. 21	·03447	23. 0	61·5	60·7
2. 33	17. 40	1. 32	·1419	4. 38	·03452			
2. 50	17. 0	1. 40	·1418	5. 11	·03457			
2. 59	17. 5	2. 13	·1426	5. 43	·03465			
3. 12	17. 35	2. 17	·1425	6. 10	·03467			
3. 20	16. 35	2. 32	·1430	6. 17	·03490			
3. 30	16. 45	2. 37	·1428	6. 26	·03467			
3. 40	15. 55	2. 43	·1431	6. 40	·03455			
4. 6	16. 5	2. 58	·1431	7. 4	·03451			
4. 27	15. 15	3. 10	·1437	7. 9	·03465			
4. 38	15. 35	3. 32	·1428	7. 18	·03458			
5. 0	15. 5	4. 0	·1438	7. 28	·03464			
5. 12	15. 10	4. 10	·1438	7. 59	·03459			
5. 28	14. 25	4. 21	·1436	8. 14	·03452			
5. 42	14. 45	4. 33	·1442	8. 50	·03420			
6. 10	13. 35	4. 41	·1440	9. 13	·03411			
6. 22	13. 40	5. 42	·1445	9. 37	·03410			
6. 27	13. 10	6. 10	·1437	9. 49	·03393			
6. 42	14. 30	6. 16	·1463	10. 22	·03400			
6. 46	13. 25	6. 22	·1448	10. 41	·03378			
6. 52	13. 45	6. 28	·1439	11. 22	·03350			
7. 2	13. 0	6. 32	·1442	11. 39	·03353			
7. 13	11. 40	6. 37	·1436	11. 51	·03340			
7. 26	12. 0	6. 39	·1438	12. 15	·03350			
7. 41	11. 10	6. 49	·1431	12. 47	·03308			
7. 53	11. 50	6. 54	·1431	13. 6	·03280			
8. 2	11. 25	7. 3	·1443	13. 30	·03247			

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June 7		June 7		June 7				
h m	° ′ ″	h m		h m		h m	°	°
8. 11	20. 11. 40	7. 10	·1443	13. 49	·03255			
8. 20	12. 25	7. 13	·1441	14. 8	·03227			
8. 30	12. 0	7. 22	·1449	14. 21	·03222			
8. 42	13. 20	7. 40	·1448	14. 28	·03230			
8. 48	12. 45	8. 2	·1429	14. 47	·03184			
8. 51	13. 20	8. 12	·1428	14. 58	·03175			
8. 57	12. 5	8. 27	·1431	15. 0	·03192			
9. 1	12. 25	8. 41	·1428	15. 8	·03180			
9. 18	11. 45	8. 46	·1431	15. 19	·03191			
9. 27	13. 0	8. 55	·1432	15. 29	·03164			
9. 32	12. 40	9. 11	·1440	15. 38	·03185			
9. 39	14. 10	9. 28	·1438	15. 58	·03132			
9. 42	13. 50	9. 35	·1444	16. 21	·03098			
9. 52	15. 0	9. 48	·1433	16. 39	·03090			
10. 2	13. 45	10. 10	·1438	16. 51	·03055			
10. 20	14. 20	10. 20	·1438	17. 3	·03040			
10. 44	7. 5	10. 28	·1447	17. 18	·03035			
10. 53	6. 10	10. 33	·1448	17. 28	·03048			
11. 4	7. 50	10. 42	·1454	17. 33	·03034			
11. 18	6. 25	10. 53	·1445	17. 44	·02972			
11. 31	8. 50	11. 3	·1444	17. 58	·02952			
11. 38	9. 20	11. 18	·1434	18. 7	·02975			
11. 52	7. 35	11. 23	·1431	18. 10	·02968			
12. 12	10. 40	11. 28	·1432	18. 20	·02977			
12. 22	11. 40	11. 32	·1428	18. 32	·03009			
12. 33	7. 0	11. 38	·1429	19. 21	·02973			
12. 48	20. 3. 40	11. 47	·1419	19. 58	·03038			
13. 0	19. 59. 20	12. 5	·1434	20. 28	·03067			
13. 2	59. 45	12. 18	·1437	21. 13	·03100			
13. 12	54. 45	12. 27	·1431	22. 1	·03125			
13. 18	55. 0	12. 53	·1420	23. 37	·03130			
13. 23	54. 10	13. 0	·1424	23. 59	·03121			
13. 31	57. 0	13. 13	·1430					
13. 38	19. 58. 20	13. 22	·1426					
13. 47	20. 2. 20	13. 32	·1427					
13. 52	3. 20	13. 41	·1435					
14. 4	1. 25	13. 57	·1422					
14. 11	2. 40	14. 7	·1418					
14. 13	2. 10	14. 17	·1426					
14. 20	4. 0	14. 28	·1428					
14. 27	2. 15	14. 33	·1420					
14. 30	20. 2. 40	14. 48	·1410					
14. 39	19. 58. 0	14. 57	·1405					
14. 48	19. 59. 5		(†)					
14. 57	20. 3. 50	15. 20	·1420					
15. 2	3. 0	15. 32	·1454					
15. 13	7. 55		***					
15. 26	2. 50	16. 10	·1452					
15. 30	4. 30	16. 22	·1438					
15. 34	4. 45	16. 32	·1432					
15. 40	3. 15	16. 33	·1435					
15. 46	3. 35	17. 3	·1403					
15. 50	1. 15	17. 22	·1437					
15. 54	1. 50	17. 28	·1448					
16. 0	1. 0	17. 33	·1426					
16. 7	1. 25	17. 37	·1393					
16. 20	1. 0	17. 42	·1379					
16. 27	2. 15	17. 47	·1375					

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

May 9. VERTICAL FORCE.—The adjustments were altered, so that the readings were increased by 17^{div}·44 or by 0·01274 parts of the whole Vertical Force. It will be necessary therefore to add 0·01274 to the indications prior to May 9 to connect them with the indications following that date.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
June 7		June 7						
h m	° ′ ″	h m		h m		m	°	°
16. 33	20. 6. 25	17. 51	·1380					
16. 43	9. 45	18. 1	·1382					
16. 49	9. 5	18. 7	·1380					
16. 57	10. 5	18. 11	·1385					
17. 2	8. 5	18. 16	·1376					
17. 6	9. 20	18. 23	·1402					
17. 12	8. 10	18. 30	·1406					
17. 15	7. 0	18. 37	·1400					
17. 17	7. 55	18. 42	·1404					
17. 20	7. 10	18. 52	·1410					
17. 22	10. 10		***					
17. 29	8. 45	19. 1	·1404					
17. 33	12. 35	19. 10	·1408					
17. 40	14. 40	19. 28	·1391					
17. 47	8. 20	19. 32	·1393					
17. 49	9. 0	19. 39	·1390					
17. 52	5. 45	19. 47	·1393					
17. 59	2. 50	19. 58	·1389					
18. 2	3. 35	20. 3	·1392					
18. 8	1. 40	20. 18	·1383					
18. 10	2. 10	20. 22	·1384					
18. 12	1. 35	20. 39	·1378					
18. 17	5. 20	20. 52	·1383					
18. 26	12. 10	21. 11	·1379					
18. 29	11. 25	21. 22	·1383					
18. 33	12. 45	21. 59	·1382					
18. 38	11. 20	22. 10	·1389					
18. 42	12. 10	22. 30	·1389					
18. 44	11. 20	22. 40	·1391					
18. 52	15. 40	23. 10	·1392					
18. 58	16. 55	23. 22	·1389					
19. 2	18. 15	23. 40	·1395					
19. 8	16. 30	23. 59	·1394					
19. 10	17. 10							
19. 13	15. 0							
19. 16	16. 5							
19. 23	13. 25							
19. 26	13. 50							
19. 32	10. 50							
19. 38	9. 25							
19. 40	10. 0							
19. 47	7. 55							
19. 49	8. 20							
19. 50	7. 50							
19. 55	8. 55							
20. 0	3. 0							
20. 2	6. 45							
20. 6	7. 55							
20. 9	6. 5							
20. 11	7. 50							
20. 18	5. 0							
20. 20	5. 40							
20. 22	5. 0							
20. 30	9. 25							
20. 42	12. 10							
20. 47	11. 35							
21. 2	13. 10							
21. 18	11. 0							

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
June 7								
h m	° ′ ″	h m		h m		h m	°	°
21. 28	20. 13. 35							
21. 31	12. 20							
21. 34	13. 0							
21. 38	12. 35							
21. 47	13. 30							
21. 52	13. 30							
21. 59	14. 15							
22. 9	13. 0							
22. 21	14. 20							
22. 32	14. 5							
22. 40	14. 45							
22. 49	15. 35							
22. 53	15. 10							
23. 18	17. 10							
23. 33	17. 15							
23. 47	18. 40							
23. 59	19. 0							
June 29		June 29		June 29		June 29		
0. 0	20. 16. 50	0. 0	·1432	0. 0	·03283	0. 0	64·0	64·7
0. 9	16. 50	0. 2	·1429	0. 8	·03280	1. 0	64·2	64·9
0. 29	18. 0	0. 25	·1433	1. 50	·03363	2. 0	64·4	65·2
0. 41	17. 25	0. 41	·1428	2. 1	·03370	3. 0	64·5	65·5
0. 58	17. 50	0. 54	·1430	3. 15	·03410	6. 0	64·7	66·1
1. 13	17. 20	1. 31	·1428	4. 7	·03425	8. 45	62·2	62·3
1. 49	18. 5	1. 47	·1433	4. 11	·03443	9. 0	63·9	64·1
2. 4	17. 30	2. 1	·1427	4. 19	·03428	10. 0	63·6	63·9
2. 12	17. 45	2. 18	·1432	4. 29	·03430	11. 0	63·1	63·6
2. 20	17. 15	2. 22	·1428	4. 35	·03438	12. 0	62·6	63·2
2. 32	17. 40	2. 37	·1432	4. 59	·03430	21. 0	63·1	63·0
2. 52	16. 45	2. 57	·1432	5. 44	·03467	22. 0	63·3	63·4
3. 2	16. 45	3. 20	·1439	5. 51	·03460	23. 0	63·5	63·8
3. 12	16. 20	3. 38	·1431	6. 30	·03480			
3. 20	16. 50	3. 47	·1432	6. 48	·03480			
3. 37	15. 35	4. 2	·1430	7. 9	·03460			
3. 58	15. 0	4. 9	·1445	7. 37	·03455			
4. 2	16. 0	4. 17	·1440	7. 44	·03435			
4. 10	15. 30	4. 22	·1443	7. 59	·03425			
4. 17	15. 40	4. 30	·1451	8. 19	·03424			
4. 31	15. 35	4. 43	·1443	8. 38	·03394			
4. 39	15. 55	4. 50	·1446	9. 13	·03370			
4. 52	14. 35	4. 57	·1439	9. 38	·03375			
5. 31	14. 5	5. 10	·1444	9. 45	·03372			
5. 44	14. 55	5. 22	·1442	10. 28	·03373			
6. 2	13. 40	5. 30	·1445	11. 34	·03353			
6. 22	13. 10	5. 33	·1442	11. 41	·03342			
6. 36	13. 15	5. 40	·1446	11. 54	·03350			
6. 41	13. 55	5. 42	·1444	12. 15	·03318			
6. 52	14. 0	5. 52	·1451	12. 28	·03318			
7. 8	15. 0	6. 11	·1450	12. 31	·03287			
7. 19	14. 5	6. 23	·1455	12. 33	·03295			
7. 34	14. 0		***	12. 48	·03209			
7. 43	14. 20	6. 57	·1452	12. 50	·03190			
8. 0	11. 45	7. 9	·1448	12. 57	·03183			
8. 10	11. 30	7. 17	·1440	12. 58	·03195			
8. 24	12. 55	7. 32	·1444	13. 0	·03175			
8. 42	13. 30	7. 43	·1457	13. 8	·03181			
8. 52	13. 20	7. 57	·1443	13. 16	·03170			
			***					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol ⁚ attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
June 29		June 29		June 29				
h m	° ′ ″	h m		h m		h m	°	°
9. 0	20. 13. 40	8. 31	·1455	13. 25	·03182			
9. 16	12. 45	8. 52	·1444	13. 29	·03207			
9. 22	12. 55	9. 1	·1445	13. 31	·03198			
9. 29	12. 30	9. 10	·1442	13. 38	·03192			
9. 42	13. 45	9. 35	·1442	13. 42	·03212			
9. 52	12. 55	9. 48	·1445	13. 48	·03205			
10. 2	13. 0	10. 0	·1442	13. 58	·03210			
10. 37	12. 0	10. 17	·1443	14. 2	·03198			
10. 47	12. 50	10. 20	·1439	14. 10	·03174			
11. 0	13. 0	10. 30	·1444	14. 22	·03165			
11. 13	14. 0	10. 37	·1440	14. 27	·03175			
11. 30	14. 25	10. 40	·1444	14. 33	·03155			
11. 35	13. 35	11. 0	·1442	14. 49	·03150			
11. 49	13. 20	11. 11	·1448	14. 52	·03160			
11. 58	12. 35	11. 17	·1445	15. 6	·03140			
12. 9	14. 20	11. 22	·1448	15. 11	·03148			
12. 20	10. 40	11. 30	·1444	15. 17	·03130			
12. 23	11. 30	11. 36	·1442	15. 20	·03145			
12. 26	9. 50	11. 46	·1446	15. 32	·03133			
12. 31	11. 5	11. 52	·1439	15. 50	·03128			
12. 39	17. 25	11. 57	·1442	15. 57	·03133			
12. 41	17. 0	12. 3	·1452	16. 33	·03118			
12. 44	20. 20	12. 9	·1447	16. 51	·03142			
12. 49	18. 15	12. 15	·1446	17. 15	·03112			
12. 52	18. 40	12. 26	·1456	17. 38	·03105			
12. 56	16. 20	12. 33	·1478	18. 1	·03116			
12. 59	14. 0	12. 37	·1494	18. 29	·03105			
13. 3	14. 20	12. 42	·1486	18. 56	·03110			
13. 8	13. 20	12. 43	·1498	19. 20	·03124			
13. 12	14. 15	12. 49	·1486	19. 47	·03147			
13. 17	11. 10	12. 53	·1456	20. 18	·03166			
13. 18	11. 40	13. 5	·1435	21. 5	·03190			
13. 23	20. 4. 45	13. 8	·1438	21. 34	·03192			
13. 36	19. 56. 25	13. 12	·1427	23. 11	·03218			
13. 38	56. 55	13. 21	·1411	23. 59	·03230			
13. 46	19. 53. 50	13. 30	·1413					
14. 2	20. 2. 0	13. 37	·1432					
14. 6	1. 55	13. 42	·1431					
14. 9	3. 10	13. 51	·1452					
14. 17	2. 30	14. 11	·1453					
14. 20	3. 50	14. 19	·1443					
14. 25	2. 45	14. 27	·1436					
14. 28	3. 30	14. 33	·1443					
14. 30	2. 20	14. 38	·1439					
14. 32	3. 40	14. 45	·1444					
14. 38	1. 35	14. 52	·1445					
14. 42	2. 20	14. 53	·1443					
14. 48	1. 10	15. 0	·1449					
14. 56	1. 0	15. 9	·1452					
15. 2	2. 50	15. 12	·1448					
15. 7	1. 20	15. 20	·1455					
15. 10	1. 40	15. 21	·1448					
15. 12	0. 0	15. 32	·1449					
15. 17	20. 0. 30	15. 39	·1451					
15. 19	19. 59. 20	15. 52	·1449					
15. 22	20. 2. 0	15. 53	·1447					
15. 28	1. 40	16. 2	·1450					
15. 32	0. 0	16. 8	·1446					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
June 29		June 29						
h m	° ′ ″	h m		h m		h m	°	°
15. 39	20. 0. 20	16. 18	·1447					
15. 45	19. 59. 50	16. 30	·1439					
15. 49	20. 0. 20	16. 40	·1423					
15. 55	19. 59. 45	16. 48	·1418					
16. 1	20. 3. 0	17. 3	·1427					
16. 26	0. 10	17. 12	·1423					
16. 37	2. 25	17. 22	·1426					
16. 47	9. 25	17. 27	·1423					
17. 2	13. 25	17. 32	·1426					
17. 15	12. 0	17. 38	·1422					
17. 18	13. 20	18. 2	·1434					
17. 23	13. 0	18. 10	·1432					
17. 29	11. 50	18. 23	·1435					
17. 32	12. 40	19. 9	·1428					
17. 37	11. 0	19. 27	·1423					
17. 42	12. 50	19. 49	·1425					
17. 44	11. 45	20. 0	·1421					
17. 49	12. 40	20. 17	·1419					
17. 53	12. 40	20. 20	·1415					
18. 2	14. 40	21. 2	·1415					
18. 7	13. 50	21. 33	·1410					
18. 20	13. 20	21. 40	·1411					
18. 23	11. 30	21. 48	·1409					
18. 28	12. 20	21. 57	·1410					
18. 36	11. 5	22. 21	·1404					
18. 38	11. 20	22. 33	·1405					
18. 53	10. 15	22. 43	·1408					
19. 8	10. 5	23. 7	·1412					
19. 20	9. 10	23. 13	·1410					
19. 32	9. 45	23. 32	·1414					
19. 52	10. 40	23. 59	·1413					
19. 58	10. 10							
20. 9	10. 45							
20. 13	9. 50							
20. 18	10. 40							
20. 22	10. 0							
20. 38	10. 10							
21. 13	13. 5							
21. 48	12. 50							
22. 9	14. 30							
22. 27	15. 0							
22. 43	14. 45							
23. 9	15. 40							
23. 25	15. 15							
23. 59	16. 0							
July 10		July 10		July 10		July 10		
0. 0	20. 20. 0	0. 0	·1432	0. 0	·03390	0. 0	65·7	66·2
0. 15	22. 50	0. 11	·1460	0. 5	·03412	1. 0	65·3	66·6
0. 25	21. 20	0. 20	·1446	0. 12	·03392	2. 0	65·3	66·6
0. 38	22. 0	0. 28	·1454	0. 28	·03388	3. 0	65·4	66·9
0. 52	22. 35		(†)	1. 0	·03410	6. 0	65·6	67·3
1. 8	24. 40	0. 50	·1447	1. 11	·03392	9. 0	65·9	66·6
1. 12	24. 15	0. 52	·1444	1. 35	·03420	21. 0	64·4	64·7
1. 21	25. 20	0. 57	·1447	1. 38	·03438	22. 0	64·6	64·8
1. 28	24. 0	1. 0	·1441	1. 40	·03422	23. 0	64·8	65·0
1. 39	25. 30	1. 8	·1443	1. 50	·03448			
1. 42	24. 40	1. 17	·1454	1. 59	·03465			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
July 10		July 10		July 10				
h m	° ′ ″	h m		h m		h m	°	°
1. 43	20. 26. 25	1. 20	·1464	2. 10	·03445			
1. 48	25. 40	1. 27	·1451	2. 21	·03480			
1. 52	26. 45	1. 32	·1459	2. 29	·03455			
1. 58	26. 35	1. 40	·1444	2. 38	·03497			
2. 2	28. 10	1. 50	·1453	2. 40	·03490			
2. 13	24. 40	1. 54	·1440	2. 50	·03532			
2. 18	25. 30	1. 58	·1458	2. 58	·03515			
2. 20	24. 40	2. 0	·1447	3. 5	·03535			
2. 26	29. 0	2. 10	·1472	3. 15	·03530			
2. 32	27. 30	2. 17	·1493	3. 28	·03590			
2. 39	28. 20	2. 22	·1485	3. 37	·03592			
2. 42	27. 10	2. 23	·1469	3. 41	·03620			
2. 50	28. 0	2. 26	·1474	3. 47	·03615			
2. 58	30. 5	2. 32	·1456	3. 51	·03632			
3. 5	31. 45	2. 38	·1470	3. 58	·03625			
3. 17	29. 10	2. 46	·1447	4. 7	·03660			
3. 21	30. 45	2. 52	·1470	4. 11	·03645			
3. 28	30. 55	2. 58	·1462	4. 20	·03665			
3. 38	24. 45	3. 0	·1466	4. 28	·03674			
3. 42	26. 0	3. 8	·1497	4. 30	.03672			
3. 47	25. 20	3. 16	·1486	4. 40	·03710			
3. 52	27. 40	3. 20	·1488	4. 45	·03692			
3. 58	28. 45	3. 30	·1461	4. 48	·03715			
4. 1	28. 20	3. 39	·1470	4. 50	·03710			
4. 6	30. 50	3. 49	·1444	4. 52	·03721			
4. 14	22. 50	4. 2	·1458	4. 55	·03710			
4. 19	22. 0	4. 10	·1446	4. 58	·03730			
4. 21	22. 25	4. 18	·1454	4. 59	·03710			
4. 33	20. 45	4. 22	·1428	5. 0	·03735			
4. 41	24. 0	4. 27	·1434	5. 4	·03745			
4. 48	22. 0	4. 32	·1427	5. 9	·03720			
4. 56	23. 40	4. 33	·1431	5. 13	·03740			
5. 1	22. 5	4. 40	·1427	5. 20	·03738			
5. 3	23. 10	4. 49	·1451	5. 27	·03752			
5. 11	17. 30	4. 55	·1441	5. 35	·03750			
5. 20	19. 35	4. 59	·1456	5. 47	·03785			
5. 22	19. 55	5. 2	·1451	5. 56	·03755			
5. 30	21. 45	5. 5	·1462	5. 59	·03769			
5. 40	17. 15	5. 9	·1454	6. 4	·03748			
5. 57	12. 40	5. 13	·1469	6. 25	·03768			
6. 7	17. 55	5. 20	·1437	6. 47	·03745			
6. 22	8. 25	5. 26	·1442	6. 57	·03748			
6. 29	5. 15	5. 30	·1436	7. 8	·03730			
6. 30	6. 5	5. 38	·1442	7. 20	·03737			
6. 39	4. 5	5. 46	·1429	7. 39	·03712			
6. 40	4. 50	5. 53	·1438	7. 46	·03722			
6. 45	4. 20	6. 2	·1427	7. 58	·03707			
6. 50	5. 5	6. 8	·1432	8. 18	·03701			
6. 59	9. 30	6. 11	·1418	8. 49	·03670			
7. 3	10. 20	6. 21	·1397	9. 17	·03654			
7. 13	8. 40	6. 33	·1419	10. 5	·03595			
7. 25	8. 0	6. 47	·1430	10. 29	·03554			
7. 31	8. 55	6. 53	·1427	10. 52	·03532			
7. 39	9. 0	7. 2	·1429	11. 20	·03475			
7. 53	12. 5	7. 12	·1418	11. 44	·03490			
8. 0	11. 50	7. 28	·1424	12. 17	·03472			
8. 13	14. 50	7. 42	·1410	12. 49	·03435			
8. 22	14. 0	7. 54	·1417	13. 5	·03375			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
July 10		July 10		July 10				
h m	° ′ ″	h m		h m		h m	°	°
8. 32	20. 15. 35	8. 2	·1414	13. 38	·03313			
8. 42	12. 0	8. 22	·1424	13. 50	·03274			
8. 46	11. 40	8. 31	·1420	14. 0	·03235			
9. 5	13. 25	8. 48	·1412	14. 19	·03200			
9. 12	12. 20	9. 2	·1414	14. 38	·03112			
9. 20	12. 20	9. 28	·1416	14. 48	·03165			
9. 22	11. 25	9. 30	·1412	15. 1	·03072			
9. 28	12. 5	9. 42	·1416	15. 20	·03055			
9. 35	13. 20	9. 57	·1415	15. 42	·03069			
9. 52	13. 25	10. 2	·1413	15. 55	·03035			
10. 3	12. 0	10. 13	·1424	16. 8	·02988			
10. 12	12. 15	10. 23	·1427	16. 18	·03050			
10. 21	11. 35		***	16. 28	·03024			
10. 31	11. 55	10. 42	·1422	16. 37	·03015			
10. 37	10. 55	10. 57	·1432	16. 39	·03028			
10. 56	15. 50	11. 18	·1411	16. 45	·03012			
11. 2	16. 25	11. 41	·1422	16. 50	·03030			
11. 26	12. 35	11. 48	·1419	16. 59	·03018			
11. 38	12. 25	11. 55	·1423	17. 7	·03037			
11. 42	11. 50	12. 11	·1425	17. 18	·02999			
11. 58	11. 35	12. 18	·1423	17. 44	·03043			
12. 9	12. 20	12. 38	·1434	18. 4	·03020			
12. 21	10. 50	12. 50	·1445	18. 11	·03037			
12. 32	11. 10	13. 7	·1436	18. 22	·03030			
12. 39	12. 20	13. 27	·1428	18. 37	·03051			
12. 42	12. 35	13. 30	·1437	18. 52	·03100			
12. 59	9. 0	13. 33	·1432	19. 8	·03120			
13. 2	8. 30	13. 46	·1442	19. 19	·03147			
13. 18	5. 5	13. 55	·1421	19. 27	·03150			
13. 29	5. 0	14. 0	·1425	20. 10	·03225			
13. 38	2. 55		***	20. 19	·03217			
13. 42	3. 30	14. 20	·1430	20. 25	·03238			
13. 47	2. 10	14. 30	·1415	20. 30	·03231			
13. 52	9. 0	14. 42	·1458	20. 38	·03248			
13. 57	10. 0	15. 2	·1440	20. 50	·03250			
14. 2	15. 20	15. 3	·1444	21. 7	·03255			
14. 8	19. 35	15. 16	·1431	21. 38	·03291			
14. 12	19. 30	15. 27	·1422		(†)			
14. 20	16. 30	15. 32	·1424	22. 43	·03304			
14. 29	22. 20	15. 42	·1406	23. 25	·03310			
14. 35	29. 5	15. 57	·1404	23. 32	·03304			
14. 42	20. 20	16. 3	·1393	23. 44	·03312			
14. 57	16. 20	16. 9	·1375	23. 59	·03338			
15. 2	16. 15	16. 19	·1400					
15. 7	13. 25	16. 40	·1392					
15. 12	13. 0	16. 43	·1399					
15. 20	13. 30	16. 52	·1390					
15. 26	12. 55	17. 18	·1384					
15. 30	14. 5	17. 24	·1377					
15. 36	13. 0	17. 38	·1397					
15. 41	13. 30	17. 48	·1399					
15. 50	12. 50	18. 0	·1387					
15. 51	12. 0	18. 10	·1398					
15. 59	11. 50	18. 20	·1398					
16. 3	9. 15	18. 22	·1401					
16. 7	10. 40	18. 33	·1389					
16. 10	17. 20	18. 50	·1381					
16. 14	19. 20	18. 53	·1384					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
July 10		July 10						
h m	° ′ ″	h m		h m		h m	°	°
16. 28	20. 15. 55	19. 1	·1377					
16. 33	16. 0	19. 7	·1380					
16. 42	13. 5	19. 23	·1378					
16. 51	18. 5	19. 30	·1374					
16. 53	20. 50	19. 43	·1380					
16. 59	28. 5	19. 52	·1372					
17. 11	18. 15		***					
17. 14	17. 35	20. 12	·1369					
17. 20	18. 0	20. 29	·1381					
17. 28	16. 40	20. 38	·1384					
17. 30	17. 0	20. 42	·1383					
17. 36	20. 10	21. 0	·1384					
17. 42	21. 15		(†)					
17. 52	23. 55	21. 30	·1384					
17. 58	23. 10	21. 38	·1381					
18. 2	23. 45		(†)					
18. 17	15. 20	22. 41	·1387					
18. 20	15. 40	23. 5	·1389					
18. 30	13. 0	23. 12	·1393					
18. 39	12. 5	23. 19	·1391					
18. 49	15. 0	23. 28	·1394					
18. 52	14. 0	23. 33	·1386					
18. 59	14. 25	23. 43	·1388					
19. 1	13. 45	23. 59	·1398					
19. 10	16. 20							
19. 20	15. 10							
19. 29	15. 50							
19. 40	13. 50							
19. 52	18. 40							
19. 59	18. 45							
20. 2	19. 25							
20. 9	18. 30							
20. 15	20. 5							
20. 20	19. 5							
20. 24	21. 0							
20. 33	22. 40							
20. 40	21. 55							
20. 48	22. 50							
21. 5	20. 50							
21. 17	19. 55							
21. 27	20. 35							
21. 37	20. 0							
	(†)							
22. 38	20. 20							
22. 45	20. 25							
22. 49	21. 15							
23. 5	20. 55							
23. 17	22. 40							
23. 40	23. 5							
23. 45	23. 40							
23. 59	24. 45							
July 14		July 14		July 14		July 14		
0. 0	20. 13. 15	0. 0	·1416	0. 0	·03390	0. 0	65·9	66·9
0. 20	14. 25	0. 23	·1423	0. 8	·03395	1. 0	65·9	66·9
0. 42	16. 5	0. 33	·1425	0. 45	·03430	3. 0	66·2	67·5
1. 12	15. 45	1. 10	·1416	0. 58	·03430	6. 0	66·6	68·3
1. 18	14. 5	1. 23	·1418	1. 23	·03440	8. 0	67·4	68·7

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
July 14		July 14		July 14		July 14		
h m	° ′ ″	h m		h m		h m	°	°
1. 22	20. 15. 20	1. 37	·1422	1. 45	·03454	9. 0	67·1	67·6
1. 32	15. 55	1. 41	·1422	2. 5	·03481	10. 0	66·6	66·8
1. 42	15. 45	2. 2	·1435	2. 35	·03495	11. 30	65·9	66·0
1. 50	16. 55	2. 18	·1435	2. 46	·03503	20. 0	65·6	65·7
2. 14	18. 0	2. 32	·1431	2. 52	·03495	21. 0	65·7	66·0
2. 31	18. 25	2. 42	·1436	3. 19	·03520	22. 0	65·8	66·4
2. 38	19. 20	2. 52	·1429	3. 29	·03530	23. 0	65·9	66·6
2. 49	18. 20	3. 12	·1438	3. 43	·03527			
3. 10	18. 10	3. 19	·1435	4. 2	·03550			
3. 20	17. 30	3. 28	·1440	4. 13	·03547			
3. 28	18. 0	3. 49	·1419	4. 32	·03560			
3. 49	16. 0	3. 55	·1421	4. 48	·03567			
4. 7	16. 50	4. 7	·1427	5. 19	·03580			
4. 18	16. 0	4. 16	·1424	6. 10	·03607			
4. 32	16. 20	4. 40	·1434	6. 29	·03620			
5. 2	15. 45	4. 48	·1433	6. 54	·03618			
5. 12	16. 5	5. 17	·1442	7. 22	·03640			
5. 26	15. 45	5. 28	·1441	7. 58	·03645			
6. 8	15. 0	5. 37	·1444	8. 40	·03638			
6. 22	15. 5	6. 2	·1448	9. 5	·03632			
6. 29	15. 30	6. 11	·1447	11. 17	·03570			
6. 42	10. 50	6. 29	·1450	11. 40	·03532			
7. 7	7. 40	6. 41	·1438	11. 50	·03540			
7. 22	9. 20	6. 52	·1438	13. 5	·03507			
7. 32	10. 0	6. 59	·1435	13. 20	·03492			
8. 3	12. 15	7. 17	·1438	13. 59	·03430			
8. 13	12. 0	7. 30	·1433	14. 17	·03400			
8. 25	12. 35	7. 38	·1435	14. 33	·03398			
9. 22	12. 45	7. 41	·1433	14. 47	·03390			
9. 42	12. 30	7. 58	·1434	15. 7	·03330			
10. 13	12. 30	8. 46	·1430	15. 39	·03290			
10. 43	11. 50	9. 12	·1433	15. 48	·03262			
11. 0	11. 30	9. 40	·1430	15. 58	·03270			
11. 12	11. 45	10. 32	·1433	16. 10	·03257			
11. 18	11. 15	11. 17	·1433	16 25	·03233			
11. 31	11. 35	12. 10	·1436	16. 39	·03190			
11. 42	11. 0	12. 22	·1439	16. 49	·03170			
12. 7	11. 20	12. 47	·1432	17. 0	·03220			
12. 13	11. 0	12. 57	·1444	17. 10	·03228			
12. 26	11. 0	13. 10	·1445	17. 23	·03220			
12. 32	11. 20	13. 22	·1455	17. 33	·03210			
12. 47	10. 0	13. 40	·1452	17. 47	·03211			
12. 59	14. 0	13. 48	·1453	17. 58	·03227			
13. 15	11. 0	14. 1	·1446	18. 9	·03227			
13. 22	11. 0	14. 12	·1441	18. 18	·03216			
13. 33	9. 40	14. 20	·1434	18. 21	·03227			
13. 52	8. 40	14. 39	·1426	18. 37	·03205			
14. 2	6. 0	14. 44	·1432	18. 40	·03220			
14. 22	3. 5	14. 52	·1456	18. 51	·03200			
14. 42	13. 5	14. 59	·1458	19. 6	·03150			
14. 48	17. 0	15. 2	·1455	19. 18	·03150			
15. 0	14. 50	15. 27	·1463	19. 24	·03167			
15. 22	6. 20	15. 42	·1454	19. 38	·03150			
15. 33	5. 35	15. 49	·1438	19. 44	·03173			
15. 41	5. 55	15. 58	·1444	19. 49	·03167			
15. 52	3. 0	16. 10	·1438	19. 58	·03190			
15. 58	3. 45	16. 39	·1389	20. 0	·03182			
16. 7	3. 25	16. 43	·1396	20. 6	·03206			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
July 14		July 14		July 14				
h m	° ′ ″	h m		h m		h m	°	°
16. 15	20. 6. 20	16. 58	·1414	20. 10	·03205			
16. 20	7. 0	17. 2	·1418	20. 18	·03230			
16. 25	10. 50	17. 8	·1427	20. 20	·03220			
16. 29	11. 45	17. 12	·1428	20. 32	·03262			
16. 40	17. 0	17. 22	·1436	20. 40	·03277			
16. 50	13. 15	17. 30	·1438	20. 58	·03300			
16. 57	15. 0	17. 37	·1435	21. 18	·03320			
17. 5	13. 20	18. 2	·1417	22. 27	·03372			
17. 11	13. 5	18. 13	·1396	22. 50	·03402			
17. 30	5. 45	18. 18	·1397	23. 32	·03415			
17. 36	6. 50	18. 30	·1362	23. 59	·03440			
17. 41	5. 0	18. 37	·1380					
17. 48	7. 0	18. 50	·1416					
17. 56	7. 0	19. 2	·1394					
18. 5	9. 45	19. 3	·1397					
18. 11	9. 50	19. 12	·1378					
18. 13	9. 20	19. 20	·1383					
18. 18	10. 45	19. 22	·1378					
18. 29	7. 55	19. 32	·1383					
18. 37	16. 35	19. 37	·1377					
18. 52	24. 0	19. 41	·1389					
19. 0	21. 5	19. 47	·1384					
19. 7	25. 5	19. 50	·1391					
19. 27	21. 45	19. 55	·1386					
19. 37	15. 35	19. 58	·1388					
19. 40	16. 5	20. 2	·1395					
19. 48	12. 0	20. 7	·1392					
19. 49	12. 40	20. 12	·1397					
19. 56	9. 0	20. 16	·1391					
19. 59	9. 40	20. 22	·1400					
20. 9	5. 35	20. 30	·1401					
20. 12	6. 40	20. 32	·1407					
20. 19	3. 10	20. 36	·1405					
20. 28	10. 55	20. 42	·1412					
20. 30	9. 55	20. 48	·1414					
20. 32	11. 5		***					
20. 40	7. 45	21. 22	·1415					
20. 49	7. 50	21. 23	·1412					
20. 52	6. 40	21. 28	·1413					
20. 58	7. 40	21. 33	·1400					
21. 0	6. 50	21. 39	·1399					
21. 3	9. 40	21. 52	·1405					
21. 17	7. 45	22. 0	·1395					
21. 21	8. 0	22. 8	·1396					
21. 30	10. 20	22. 22	·1404					
21. 41	10. 45	22. 42	·1403					
21. 52	12. 35	22. 47	·1402					
22. 4	12. 0	22. 59	·1398					
22. 18	12. 0	23. 13	·1400					
22. 22	12. 40		(†)					
22. 32	12. 50	23. 59	·1394					
22. 34	13. 55							
22. 43	13. 55							
22. 48	15. 20							
22. 58	15. 20							
23. 18	16. 35							
23. 33	16. 45							
23. 40	17. 50							

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
July 14								
h m	° ′ ″	h m		h m		h m	°	°
23. 46	20. 17. 20							
23. 59	18. 0							
Aug. 30		Aug. 30		Aug. 30		Aug. 30		
0. 0	20. 24. 30		(†)	0. 0	·02945	0. 20	65·3	66·7
0. 7	22. 45	1. 12	·1440	0. 19	·02977	8. 0	66·5	67·3
0. 12	22. 30	1. 32	·1428	0. 28	·02990	9. 0	66·4	67·3
0. 22	22. 55	1. 42	·1437	0. 41	·02992	21. 0	65·4	65·9
0. 44	26. 0	1. 49	·1433	0. 58	·03015	22. 0	65·3	65·7
1. 0	25. 0	2. 0	·1452	1. 10	·03050	23. 0	65·5	66·3
1. 9	25. 5	2. 23	·1429	1. 43	·03060			
1. 22	27. 10	2. 37	·1425	1. 51	·03051			
1. 34	25. 40	2. 56	·1452	2. 20	·03087			
1. 42	26. 10	3. 5	·1435	2. 35	·03087			
2. 11	23. 20	3. 20	·1426	2. 46	·03067			
2. 37	25. 25	3. 32	·1424	3. 1	·03080			
2. 51	23. 0	3. 39	·1427	3. 20	·03111			
3. 0	23. 55	3. 50	·1420	3. 37	·03100			
3. 12	22. 55	3. 58	·1424	4. 0	·03104			
3. 22	22. 50	4. 11	·1415	4. 35	·03115			
3. 40	19. 0	4. 35	·1431	5. 0	·03132			
3. 53	20. 10	4. 49	·1429	5. 26	·03120			
4. 4	19. 20	5. 8	·1408	5. 42	·03157			
4. 20	20. 20	5. 13	·1417	5. 58	·03202			
4. 23	19. 55	5. 20	·1436	6. 25	·03195			
4. 31	20. 0	5. 27	·1448	6. 38	·03177			
4. 49	17. 10	5. 32	·1443	6. 55	·03179			
4. 53	17. 30	5. 37	·1447	7. 7	·03166			
4. 59	16. 55	5. 50	·1438	7. 37	·03165			
5. 2	17. 15	5. 55	·1442	8. 35	·03148			
5. 10	16. 50	6. 2	·1434	8. 58	·03130			
5. 18	17. 0	6. 7	·1437	9. 15	·03090			
5. 33	14. 10	6. 10	·1435	9. 30	·03040			
5. 40	20. 11. 0	6. 20	·1442	9. 46	·03004			
5. 52	19. 59. 0	6. 33	·1427	9. 58	·02980			
6. 9	20. 3. 10	6. 49	·1437	10. 3	·02955			
6. 31	7. 45	6. 50	·1433	10. 8	·02969			
6. 37	7. 0	7. 2	·1445	10. 10	·02960			
6. 59	12. 0	7. 13	·1445	10. 23	·03018			
7. 11	10. 0	7. 22	·1452	10. 37	·03050			
7. 19	10. 40		(†)	10. 48	·03045			
7. 27	10. 0	8. 9	·1428	11. 0	·02980			
7. 39	10. 50	8. 21	·1429	11. 15	·02955			
7. 42	10. 20	8. 39	·1422	11. 20	·02965			
8. 11	13. 0	8. 52	·1434	11. 43	·02885			
8. 15	12. 40	9. 8	·1422	12. 7	·02954			
8. 36	14. 30	9. 18	·1442	12. 37	·02925			
9. 1	6. 0	9. 36	·1440	12. 50	·02942			
9. 3	3. 30	9. 43	·1418	13. 16	·02933			
9. 12	20. 1. 30	9. 49	·1404	13. 28	·02943			
9. 22	19. 58. 0	9. 55	·1394	13. 35	·02933			
9. 48	56. 0	10. 26	·1425	13. 48	·02935			
10. 8	19. 51. 0	10. 37	·1416	13. 59	·02906			
10. 40	20. 6. 0	10. 42	·1427	14. 3	·02895			
10. 49	9. 0	10. 50	·1462	14. 7	·02908			
10. 59	10. 5	10. 52	·1468	14. 20	·02824			
11. 12	5. 5	10. 58	·1463	14. 33	·02850			
11. 31	18. 10	11. 9	·1433	14. 39	·02842			

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Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Aug.30		Aug.30		Aug.30				
h m	° ′ ″	h m		h m		h m	°	°
11. 34	20. 12. 50	11. 18	·1424	14. 49	·02865			
11. 41	6. 20	11. 39	·1451	15. 10	·02855			
11. 49	5. 0	11. 43	·1454	15. 17	·02865			
12. 11	10. 20	12. 7	·1442	15. 28	·02828			
12. 32	4. 30	12. 13	·1444	15. 39	·02860			
12. 50	7. 55	12. 23	·1438	15. 49	·02860			
13. 12	4. 25	12. 32	·1436	16. 8	·02885			
13. 22	5. 20	12. 40	·1429	16. 29	·02828			
13. 37	5. 10	12. 47	·1426	16. 59	·02840			
13. 50	10. 20	13. 0	·1422	17. 9	·02855			
14. 2	19. 35	13. 7	·1410	17. 19	·02846			
14. 21	11. 5	13. 23	·1422	17. 29	·02849			
14. 31	12. 5	13. 32	·1422	17. 39	·02864			
14. 36	9. 30	13. 47	·1447	18. 0	·02890			
14. 46	11. 35	13. 53	·1454	18. 15	·02900			
14. 53	12. 0	14. 12	·1428	18. 40	·02930			
14. 57	11. 20	14. 22	·1435	18. 59	·02928			
15. 9	17. 30	14. 41	·1414	19. 50	·02967			
15. 29	6. 30	14. 52	·1432	19. 57	·02962			
15. 37	7. 45	15. 10	·1444	20. 7	·02968			
15. 40	6. 20	15. 47	·1442	20. 31	·02970			
15. 49	8. 0	16. 1	·1412	21. 25	·02960			
15. 51	11. 20	16. 20	·1402	21. 50	·02970			
16. 16	19. 20	16. 31	·1410	21. 59	·02970			
16. 19	17. 30	16. 46	·1417	22. 25	·02980			
16. 31	17. 55	16. 57	·1410	22. 58	·02990			
16. 38	18. 50	17. 11	·1412	23. 33	·03006			
16. 49	16. 40	17. 19	·1407	23. 59	·03040			
16. 59	18. 0	17. 52	·1425					
17. 8	20. 35	18. 10	·1419					
17. 18	19. 40	18. 18	·1422					
17. 26	17. 40	18. 40	·1406					
17. 32	18. 35	18. 45	·1408					
17. 49	13. 30	18. 52	·1406					
17. 58	14. 15	19. 3	·1411					
18. 5	12. 55	19. 12	·1406					
18. 14	13. 0	19. 30	·1416					
18. 26	15. 30	19. 42	·1413					
18. 29	14. 45	19. 52	·1403					
18. 38	16. 45	20. 32	·1414					
18. 50	18. 0	20. 52	·1416					
18. 56	16. 55	21. 20	·1410					
19. 0	18. 5	22. 0	·1417					
19. 3	16. 15	22. 13	·1422					
19. 12	16. 20	22. 33	·1412					
19. 22	17. 20	22. 47	·1417					
19. 26	16. 45	22. 58	·1414					
19. 29	17. 45		(†)					
19. 32	17. 0							
19. 48	17. 20							
19. 50	19. 50							
19. 52	18. 20							
19. 58	20. 30							
20. 6	20. 0							
20. 13	21. 5							
20. 34	21. 45							
20. 49	22. 50							
21. 0	20. 55							

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Aug.30								
h m	° ′ ″	h m		h m		h m	°	°
21. 12	20. 21. 0							
21. 29	18. 50							
21. 32	19. 20							
21. 41	18. 0							
21. 49	18. 45							
22. 3	18. 0							
22. 11	18. 55							
22. 22	18. 20							
22. 53	21. 55							
23. 5	20. 20							
23. 15	20. 45							
23. 27	18. 40							
23. 33	19. 15							
23. 41	18. 30							
23. 49	19. 15							
23. 59	18. 25							
Sept.15		Sept.15		Sept.15		Sept.15		
0. 0	20. 21. 35		(†)	0. 0	·02750	0. 0	65 ·2	66 ·2
0. 14	20. 50	0. 20	·1423	0. 12	·02761	1. 0	65 ·1	65 ·6
0. 20	21. 50	0. 22	·1434	0. 20	·02778	3. 0	65 ·3	65 ·2
0. 23	20. 50	0. 28	·1429	0. 25	·02768	6. 0	64 ·9	65 ·2
0. 28	22. 20	0. 32	·1438	0. 29	·02790	9. 0	63 ·9	64 ·0
0. 36	20. 55	0. 34	·1428	0. 32	·02773	21. 0	63 ·6	64 ·0
0. 40	21. 20	0. 40	·1433	0. 35	·02781	22. 0	64 ·0	64 ·4
0. 42	23. 20	0. 41	·1430	0. 39	·02782	23. 0	64 ·3	65 ·0
0. 47	23. 0	0. 47	·1439	0. 58	·02810			
0. 50	24. 30	0. 50	·1438	1. 17	·02812			
0. 52	23. 55	1. 3	·1446	1. 33	·02827			
0. 57	25. 20	1. 18	·1437	1. 59	·02828			
1. 0	24. 30	1. 31	·1438	2. 11	·02823			
1. 4	24. 30	1. 51	·1424	3. 0	·02848			
1. 12	24. 0	1. 58	·1421	3. 18	·02847			
1. 32	24. 45	2. 17	·1398	3. 33	·02858			
1. 42	23. 55	2. 20	·1400	3. 41	·02855			
1. 59	24. 20	2. 23	·1394	3. 58	·02870			
2. 18	23. 30	2. 30	·1402	4. 12	·02902			
2. 23	24. 20	2. 45	·1409	4. 39	·02910			
2. 42	22. 15	2. 56	·1419	4. 45	·02903			
2. 46	22. 30	2. 57	·1417	4. 52	·02905			
2. 51	21. 40	3. 2	·1428	5. 0	·02890			
2. 58	22. 0	3. 9	·1427	5. 24	·02895			
3. 2	21. 20	3. 21	·1428	5. 48	·02887			
3. 20	20. 15	3. 40	·1434	6. 18	·02860			
3. 28	20. 50	3. 49	·1427	6. 42	·02847			
3. 38	19. 35	3. 56	·1428	7. 16	·02813			
3. 43	18. 20	4. 0	·1424	7. 48	·02790			
3. 52	17. 55	4. 7	·1427	8. 32	·02770			
4. 0	15. 20	4. 11	·1423	8. 53	·02780			
4. 2	15. 35	4. 33	·1441	9. 31	·02748			
4. 20	10. 40	4. 39	·1439	9. 55	·02764			
4. 40	16. 55	4. 44	·1441	10. 31	·02753			
4. 50	18. 25	4. 52	·1435	11. 9	·02780			
5. 2	15. 50	5. 7	·1417	11. 19	·02754			
5. 21	16. 5	5. 22	·1423	11. 28	·02775			
5. 31	17. 5	5. 30	·1428	11. 33	·02772			
5. 47	16. 0	5. 42	·1431	11. 39	·02792			
6. 2	16. 5	5. 47	·1428	11. 44	·02760			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Sept. 15		Sept. 15		Sept. 15				
h m	° ′ ″	h m		h m		h m	°	°
6. 21	20. 15. 0	6. 7	·1438	11. 48	·02790			
6. 31	15. 5	6. 20	·1432	11. 49	·02730			
6. 39	14. 20	6. 30	·1440	11. 56	·02774			
6. 49	14. 25	6. 36	·1438	11. 59	·02773			
7. 3	13. 45	6. 43	·1441	12. 1	·02756			
7. 41	13. 55	6. 50	·1440	12. 8	·02787			
7. 55	13. 0	6. 59	·1442	12. 17	·02748			
8. 0	12. 10	7. 17	·1442	12. 23	·02777			
8. 13	11. 55	7. 30	·1445	12. 36	·02750			
8. 26	9. 25	7. 37	·1443	12. 38	·02730			
8. 32	9. 5	7. 47	·1446	12. 45	·02753			
8. 49	11. 10	8. 7	·1445	12. 53	·02722			
9. 11	12. 0	8. 18	·1450	13. 23	·02587			
9. 26	10. 30	8. 25	·1444	13. 48	·02623			
9. 40	11. 5	8. 37	·1443	14. 8	·02638			
10. 8	13. 55	8. 50	·1452	14. 22	·02630			
10. 18	13. 0	8. 57	·1460	14. 33	·02625			
10. 30	10. 40	9. 18	·1458	15. 0	·02671			
10. 45	8. 20	9. 33	·1451	15. 17	·02648			
10. 53	8. 20	9. 47	·1461	15. 25	·02660			
11. 7	11. 5	10. 8	·1465	15. 43	·02665			
11. 16	10. 0	10. 32	·1456	15. 59	·02634			
11. 20	11. 15	10. 40	·1451	16. 13	·02610			
11. 24	11. 10	10. 42	·1447	16. 23	·02602			
11. 31	13. 25	10. 49	·1448	16. 29	·02590			
	(†)	10. 52	·1452	16. 40	·02630			
12. 36	13. 50	11. 0	·1449	16. 45	·02620			
12. 41	12. 5	11. 11	·1459	16. 50	·02631			
12. 49	19. 25	11. 17	·1452	17. 4	·02602			
12. 52	18. 40	11. 20	·1439	17. 10	·02610			
12. 58	20. 35	11. 28	·1448	17. 19	·02585			
13. 7	22. 0	11. 30	·1446	17. 39	·02572			
13. 14	17. 50	11. 37	·1465	17. 59	·02586			
13. 35	20. 1. 25	11. 40	·1444	18. 20	·02580			
13. 49	19. 58. 50	11. 45	·1466	18. 30	·02566			
14. 4	20. 1. 50	11. 49	·1420	18. 50	·02594			
14. 11	4. 45	11. 58	·1448	19. 4	·02570			
14. 17	5. 10	12. 3	·1436	19. 25	·02590			
14. 23	20. 3. 30	12. 8	·1460	19. 33	·02590			
14. 40	19. 53. 40	12. 12	·1429	19. 40	·02595			
14. 49	52. 45	12. 21	·1440	19. 48	·02610			
15. 8	58. 30	12. 37	·1419	20. 5	·02610			
15. 18	56. 50	12. 43	·1441	20. 12	·02607			
15. 33	19. 59. 55	12. 50	·1430	20. 28	·02628			
15. 39	20. 0. 0	12. 52	·1432	20. 50	·02610			
15. 53	4. 50	13. 15	·1399	21. 5	·02632			
16. 2	2. 20	13. 21	·1394	21. 38	·02645			
16. 8	4. 5	13. 53	·1433	22. 5	·02674			
16. 14	2. 50	14. 2	·1435	22. 11	·02700			
16. 22	20. 4. 20	14. 9	·1432	22. 17	·02690			
16. 35	19. 59. 0	14. 22	·1406	22. 28	·02738			
16. 43	20. 4. 50	14. 31	·1402	22. 37	·02725			
16. 52	8. 5	14. 40	·1405	22. 49	·02738			
16. 59	7. 45	15. 0	·1430	23. 9	·02787			
17. 2	11. 30	15. 7	·1425	23. 25	·02823			
17. 8	11. 0	15. 17	·1415	23. 29	·02811			
17. 13	16. 10	15. 30	·1418	23. 36	·02828			
17. 22	12. 40	15. 44	·1428	23. 59	·02880			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Sept. 15		Sept. 15						
h m	° ′ ″	h m		h m		h m	°	°
17. 30	20. 12. 55	15. 58	·1415					
17. 37	10. 55	16. 2	·1419					
17. 41	13. 20	16. 12	·1411					
17. 48	13. 50	16. 22	·1408					
17. 57	19. 20	16. 30	·1399					
18. 8	22. 0	16. 40	·1416					
18. 10	21. 20	16. 50	·1424					
18. 13	22. 55	16. 58	·1421					
18. 22	22. 10	17. 5	·1403					
18. 23	23. 25	17. 8	·1403					
18. 32	21. 55	17. 13	·1398					
18. 42	25. 50	17. 28	·1429					
18. 52	28. 10	17. 36	·1431					
19. 3	20. 40	17. 41	·1438					
19. 20	17. 45	17. 43	·1431					
19. 31	19. 35	17. 57	·1421					
19. 38	21. 50	18. 8	·1406					
19. 43	27. 0	18. 22	·1396					
19. 49	26. 0	18. 31	·1383					
20. 2	27. 50	18. 39	·1377					
20. 12	25. 45	18. 50	·1392					
20. 18	26. 50	19. 0	·1378					
20. 21	26. 15	19. 2	·1380					
20. 22	28. 5	19. 20	·1370					
20. 26	27. 25	19. 22	·1373					
20. 31	28. 40	19. 28	·1369					
20. 41	25. 25	19. 37	·1369					
20. 46	26. 0	19. 43	·1374					
20. 55	24. 5	19. 48	·1370					
21. 1	25. 55	19. 52	·1372					
21. 3	23. 45	20. 3	·1366					
21. 12	25. 55	20. 12	·1356					
21. 21	24. 15	20. 22	·1363					
21. 33	24. 15	20. 43	·1342					
21. 40	21. 20	21. 0	·1349					
21. 58	18. 35	21. 9	·1339					
22. 10	22. 0	21. 18	·1350					
22. 13	21. 55	21. 37	·1352					
22. 21	24. 20	21. 43	·1355					
22. 28	21. 0	21. 50	·1361					
22. 37	25. 5	21. 53	·1352					
22. 43	22. 55	22. 1	·1356					
22. 52	25. 40	22. 20	·1331					
23. 0	23. 40	22. 36	·1375					
23. 13	26. 40	22. 39	·1371					
23. 19	24. 0	22. 48	·1380					
23. 22	24. 50	22. 59	·1366					
23. 29	23. 5	23. 7	·1375					
23. 32	25. 50	23. 18	·1373					
23. 37	24. 30	23. 22	·1384					
23. 45	26. 45	23. 28	·1385					
23. 50	24. 40	23. 32	·1396					
23. 59	23. 40	23. 38	·1389					
		23. 40	·1392					
		23. 48	·1374					
		23. 52	·1379					
		23. 59	·1416					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Sept. 20		Sept. 20		Sept. 20		Sept. 20		
h m	° ′ ″	h m		h m		h m	°	°
0. 0	20. 21. 30	0. 0	·1431	0. 0	·02780	0. 0	65·0	65·8
0. 45	22. 20	0. 49	·1434	0. 52	·02805	8. 0	62·2	64·3
0. 53	24. 10	1. 1	·1442	1. 15	·02838	21. 0	62·6	63·3
1. 10	25. 45	1. 12	·1446	1. 27	·02830	22. 30	63·6	64·3
1. 20	23. 0	1. 26	·1435	2. 28	·02879	23. 0	63·7	64·6
1. 28	21. 55	1. 38	·1429	2. 42	·02880			
1. 32	20. 55	2. 14	·1429	3. 30	·02900			
1. 43	21. 20	2. 23	·1432	3. 38	·02912			
1. 47	20. 45	2. 42	·1427	3. 51	·02900			
1. 53	21. 0	2. 57	·1431	4. 7	·02913			
2. 8	21. 25	3. 13	·1438	4. 13	·02910			
2. 13	21. 20	3. 22	·1435	4. 33	·02933			
2. 20	22. 10	3. 32	·1438	4. 40	·02931			
2. 22	21. 50	3. 41	·1443	4. 58	·02950			
2. 32	21. 55	3. 57	·1430	5. 5	·02947			
2. 40	20. 30	4. 10	·1433	5. 17	·02970			
2. 49	21. 30	4. 22	·1428	5. 36	·02958			
3. 3	21. 45	4. 33	·1440	5. 50	·02970			
3. 12	22. 0	4. 41	·1439	6. 8	·02939			
3. 18	21. 15	4. 54	·1443	6. 20	·02940			
3. 29	22. 0	5. 2	·1432	6. 37	·02950			
3. 32	22. 55	5. 15	·1442	6. 55	·02928			
3. 53	21. 10	5. 20	·1439	7. 0	·02930			
4. 0	21. 30	5. 27	·1443	7. 27	·02900			
4. 28	17. 0	5. 32	·1437	7. 41	·02887			
4. 32	16. 55	5. 38	·1440	8. 15	·02885			
4. 48	13. 10	5. 50	·1460	8. 26	·02848			
4. 56	14. 25	6. 7	·1438	8. 33	·02847			
5. 3	11. 0	6. 14	·1437	8. 43	·02825			
5. 17	12. 55	6. 21	·1430	8. 55	·02810			
5. 22	11. 20	6. 32	·1442	9. 2	·02810			
5. 27	11. 55	6. 36	·1441	9. 15	·02785			
5. 40	6. 0	6. 40	·1445	9. 41	·02790			
5. 49	11. 0	6. 49	·1436	9. 58	·02773			
5. 58	13. 45	6. 57	·1442	10. 27	·02790			
6. 12	10. 45	7. 7	·1434	10. 57	·02812			
6. 21	5. 15	7. 20	·1444	11. 31	·02811			
6. 30	8. 50	7. 38	·1418	12. 40	·02806			
6. 40	11. 50	7. 42	·1398	13. 35	·02783			
6. 49	7. 55	7. 50	·1418	14. 35	·02737			
6. 54	10. 0	7. 53	·1415	14. 49	·02710			
7. 0	10. 5	8. 8	·1447	15. 18	·02670			
7. 10	7. 15	8. 17	·1435	15. 35	·02673			
7. 16	6. 45	8. 29	·1454	16. 4	·02667			
7. 21	10. 30	8. 37	·1435	16. 30	·02660			
7. 26	9. 45	8. 45	·1430	16. 45	·02620			
7. 31	20. 10. 0	8. 58	·1438	16. 59	·02620			
7. 59	19. 54. 0	9. 7	·1424	17. 9	·02630			
8. 8	20. 2. 0	9. 29	·1427	17. 27	·02622			
8. 18	19. 55. 5	9. 33	·1431	17. 53	·02615			
8. 29	20. 2. 50	9. 43	·1423	18. 59	·02598			
8. 33	5. 50	10. 2	·1432	19. 56	·02595			
8. 50	0. 45	10. 14	·1428	20. 20	·02587			
9. 0	20. 2. 25	10. 49	·1434	21. 29	·02593			
9. 12	19. 58. 25	10. 55	·1433	22. 4	·02608			
9. 19	20. 0. 30	11. 32	·1440	23. 24	·02652			
9. 28	1. 55	11. 40	·1438	23. 36	·02665			
9. 37	3. 20	12. 17	·1443	23. 59	·02670			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Sept. 20		Sept. 20						
h m	° ′ ″	h m		h m		h m	°	°
9. 50	20. 0. 0	12. 22	·1439					
10. 12	3. 45	12. 31	·1442					
10. 22	4. 40	12. 38	·1438					
10. 30	4. 30	12. 53	·1439					
10. 50	8. 30	13. 3	·1438					
11. 20	10. 45	13. 22	·1440					
12. 7	12. 0	13. 40	·1444					
12. 13	12. 30	14. 11	·1438					
12. 23	11. 40	14. 36	·1456					
12. 35	12. 15	14. 47	·1459					
12. 42	12. 0	15. 3	·1456					
12. 52	12. 20	15. 18	·1444					
13. 6	11. 40	15. 28	·1446					
13. 28	11. 55	15. 36	·1443					
13. 47	10. 0	15. 47	·1445					
14. 0	10. 35	15. 57	·1439					
14. 24	15. 35	16. 9	·1424					
14. 33	13. 20	16. 19	·1419					
14. 44	12. 0	16. 47	·1437					
14. 58	8. 5	16. 50	·1435					
15. 5	5. 30	17. 12	·1451					
15. 18	4. 15	17. 32	·1452					
15. 28	5. 20	17. 43	·1449					
15. 37	5. 30	18. 2	·1449					
15. 51	7. 40	18. 20	·1443					
16. 8	14. 0	18. 31	·1445					
16. 28	20. 20	18. 37	·1443					
16. 38	15. 25	18. 57	·1447					
16. 43	15. 20	19. 5	·1444					
16. 58	13. 40	19. 17	·1447					
17. 9	13. 50	19. 28	·1442					
17. 23	11. 30	19. 38	·1444					
17. 37	13. 0	20. 30	·1433					
18. 13	15. 30	20. 33	·1429					
18. 19	15. 0	21. 30	·1446					
18. 37	16. 5	21. 36	·1443					
18. 48	15. 25	22. 10	·1442					
19. 2	16. 10	22. 18	·1438					
19. 13	15. 35	22. 22	·1442					
19. 30	16. 25	22. 37	·1433					
19. 42	15. 20	22. 58	·1438					
19. 57	16. 55	23. 25	·1442					
20. 17	15. 45	23. 30	·1440					
20. 23	16. 10	23. 38	·1443					
20. 32	15. 55	23. 59	·1436					
20. 52	16. 20							
21. 0	16. 0							
21. 8	17. 5							
21. 29	16. 50							
21. 52	14. 50							
22. 26	16. 10							
22. 47	13. 45							
23. 4	14. 10							
23. 28	15. 45							
23. 42	17. 25							
23. 59	16. 15							

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H.F. Magnet.	Of V.F. Magnet.
Sept. 27 h m	° ′ ″	Sept. 27 h m		Sept. 27 h m		Sept. 27 h m	°	°
0. 0	20. 19. 0		(†)	0. 0	·02690	0. 0	64·1	64·6
0. 32	20. 5	0. 20	·1434	0. 33	·02703	1. 0	64·4	64·6
0. 42	23. 10	0. 30	·1427	0. 51	·02690	6. 0	65·0	65·1
0. 53	21. 45	0. 48	·1440	1. 8	·02697	8. 15	65·4	65·6
1. 2	23. 0	1. 2	·1428	1. 35	·02695	18. 0	62·1	63·3
1. 8	22. 15	1. 7	·1432	1. 58	·02698	19. 0	63·2	63·3
1. 12	23. 30	1. 15	·1425	2. 15	·02713	20. 0	63·1	63·1
1. 17	22. 50	1. 22	·1424	2. 39	·02768	21. 0	63·7	63·5
1. 21	24. 0	1. 37	·1412	3. 2	·02771	22. 0	64·1	63·9
1. 33	22. 5	1. 40	·1416	3. 22	·02798	23. 0	64·2	64·4
1. 39	24. 50	1. 52	·1409	3. 47	·02830			
1. 41	24. 0	2. 15	·1428	3. 49	·02818			
1. 47	25. 0	2. 43	·1430	4. 0	·02840			
1. 57	21. 0	3. 18	·1449	4. 8	·02840			
2. 7	18. 15	3. 28	·1445	4. 17	·02854			
2. 11	19. 30	3. 43	·1443	4. 23	·02850			
2. 13	18. 25	4. 0	·1417	4. 31	·02880			
2. 18	19. 20	4. 7	·1435	4. 36	·02870			
2. 24	17. 40	4. 11	·1432	4. 40	·02879			
2. 29	18. 50	4. 13	·1439	4. 48	·02864			
2. 32	18. 20	4. 20	·1437	4. 52	·02875			
2. 41	20. 5	4. 28	·1450	4. 59	·02860			
2. 44	19. 5	4. 37	·1447	5. 8	·02865			
2. 53	20. 0	4. 43	·1448	5. 20	·02955			
3. 3	16. 20	5. 0	·1412	5. 28	·02923			
3. 12	17. 25	5. 20	·1482	5. 34	·02892			
3. 18	16. 55	5. 30	·1413	5. 41	·02812			
3. 22	17. 30	5. 34	·1399	5. 51	·02837			
3. 30	16. 10	5. 43	·1412	6. 0	·02827			
3. 32	18. 5	5. 52	·1412	6. 12	·02840			
3. 38	17. 45	6. 8	·1440	6. 59	·02805			
3. 48	20. 0	6. 17	·1432	7. 37	·02798			
3. 58	17. 10	6. 32	·1435	7. 55	·02802			
4. 7	17. 0	6. 48	·1426	8. 37	·02790			
4. 17	10. 30	7. 7	·1425	9. 0	·02780			
4. 21	7. 55	7. 14	·1432	9. 21	·02758			
4. 31	13. 0	7. 26	·1430	9. 50	·02740			
4. 40	14. 20	7. 37	·1423	10. 26	·02740			
4. 42	13. 20	8. 8	·1429	10. 39	·02724			
4. 51	15. 45	8. 22	·1422	10. 59	·02718			
4. 58	20. 11. 55	8. 31	·1424	11. 9	·02720			
5. 2	19. 48. 15	8. 49	·1420	11. 21	·02691			
5. 9	46. 5	9. 3	·1440	11. 34	·02661			
5. 11	19. 42. 20	9. 24	·1431	11. 48	·02645			
5. 27	20. 14. 20	9. 33	·1435	11. 59	·02620			
5. 32	8. 50	9. 52	·1428	12. 17	·02628			
5. 33	20. 3. 25	10. 0	·1432	12. 28	·02611			
5. 41	19. 57. 20	10. 10	·1430	12. 31	·02618			
5. 45	58. 40	10. 22	·1431	12. 50	·02605			
5. 53	53. 40	10. 30	·1437	13. 16	·02617			
6. 10	19. 59. 55	10. 41	·1432	13. 28	·02617			
6. 26	20. 4. 55	10. 47	·1435	13. 42	·02631			
6. 36	8. 30	11. 0	·1432	14. 1	·02643			
6. 40	8. 10	11. 12	·1441	14. 11	·02640			
6. 50	9. 10	11. 22	·1428	14. 24	·02645			
6. 57	11. 20	11. 34	·1418	14. 55	·02630			
7. 0	11. 0	11. 40	·1424	15. 22	·02633			
7. 5	12. 30	11. 47	·1413	15. 43	·02645			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H.F. Magnet.	Of V.F. Magnet.
Sept. 27 h m	° ′ ″	Sept. 27 h m		Sept. 27 h m		h m	°	°
7. 22	20. 15. 0	11. 50	·1420	16. 9	·02625			
7. 37	12. 10	11. 58	·1411	16. 20	·02631			
7. 42	11. 40	12. 21	·1441	16. 31	·02627			
7. 53	9. 5	12. 30	·1436	16. 58	·02614			
8. 0	8. 55	12. 37	·1439	17. 26	·02592			
8. 5	9. 45	12. 52	·1428	18. 0	·02595			
8. 16	6. 0	13. 22	·1437	18. 16	·02580			
8. 31	20. 4. 0	13. 38	·1429	18. 23	·02592			
8. 49	19. 57. 10	13. 42	·1432	18. 38	·02580			
9. 8	20. 6. 30	14. 2	·1432	19. 4	·02567			
9. 12	6. 50	14. 15	·1420	19. 50	·02570			
9. 22	5. 20	14. 42	·1430	20. 0	·02550			
9. 30	6. 20	14. 52	·1424	20. 10	·02562			
9. 59	2. 25	15. 3	·1436	20. 19	·02551			
10. 7	2. 25	15. 12	·1428	20. 50	·02563			
10. 33	7. 0	15. 18	·1433	22. 28	·02590			
10. 50	5. 30	15. 23	·1428	23. 13	·02580			
11. 3	6. 30	15. 48	·1434	23. 37	·02591			
11. 22	12. 55	15. 52	·1431	23. 59	·02608			
11. 31	14. 20	16. 10	·1437					
11. 41	13. 0	16. 14	·1434					
11. 57	15. 40	16. 22	·1437					
12. 22	5. 55	16. 34	·1432					
12. 27	5. 50	16. 40	·1436					
12. 40	3. 50	16. 58	·1437					
12. 49	6. 20	17. 29	·1425					
12. 57	6. 40	17. 56	·1433					
13. 2	4. 45	18. 17	·1445					
13. 13	4. 25	18. 22	·1438					
13. 31	5. 0	18. 39	·1453					
13. 40	5. 0	18. 54	·1441					
14. 5	8. 25	19. 2	·1446					
14. 11	11. 0	19. 10	·1442					
14. 19	12. 0	19. 28	·1441					
14. 29	11. 20	19. 31	·1438					
14. 38	14. 20	19. 51	·1438					
14. 41	13. 50	20. 7	·1416					
14. 45	14. 50	20. 11	·1421					
14. 52	14. 30	20. 20	·1406					
15. 4	11. 0	20. 27	·1407					
15. 11	12. 20	20. 40	·1394					
15. 26	13. 0	20. 49	·1400					
15. 32	10. 55	20. 52	·1396					
15. 41	10. 25	21. 12	·1410					
15. 57	12. 45	21. 50	·1422					
16. 0	11. 30	22. 3	·1426					
16. 6	12. 20	22. 30	·1423					
16. 11	11. 15	23. 0	·1432					
16. 17	11. 0	23. 12	·1435					
16. 22	9. 50	23. 29	·1431					
16. 29	11. 45	23. 41	·1423					
16. 48	13. 5	23. 45	·1428					
17. 2	16. 25	23. 50	·1425					
17. 11	17. 0	23. 59	·1410					
17. 20	19. 0							
17. 27	19. 0							
17. 35	17. 50							
17. 42	17. 50							

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol ; attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Sept. 27								
h m	° ′ ″	h m		h m		h m	°	°
17. 47	20. 17. 25							
17. 52	19. 20							
18. 5	19. 0							
18. 9	19. 35							
18. 11	18. 20							
18. 16	19. 0							
18. 30	17. 20							
18. 42	18. 50							
18. 58	15. 30							
19. 0	15. 50							
19. 7	13. 5							
19. 40	11. 20							
19. 48	12. 0							
19. 58	13. 55							
20. 2	15. 35							
20. 7	14. 50							
20. 10	15. 30							
20. 12	14. 0							
20. 17	15. 35							
20. 30	13. 50							
20. 37	15. 35							
20. 41	17. 50							
20. 44	17. 10							
20. 55	20. 0							
20. 59	19. 35							
21. 5	21. 45							
21. 12	20. 0							
21. 21	21. 55							
21. 31	19. 50							
21. 42	20. 15							
21. 55	18. 40							
22. 10	15. 0							
22. 31	14. 10							
22. 37	14. 30							
22. 45	13. 20							
23. 22	17. 25							
23. 32	16. 20							
23. 33	17. 45							
23. 50	17. 0							
23. 59	20. 0							
Sept. 30		Sept. 30		Sept. 30		Sept. 30		
0. 0	20. 14. 10	0. 0	·1426	0. 0	·02522	0. 0	63·8	64·0
0. 11	14. 30	1. 4	·1434	0. 25	·02532	1. 0	64·0	64·2
0. 13	14. 0		(†)	1. 40	·02570	2. 0	63·8	63·7
0. 32	14. 15	3. 12	·1438	1. 59	·02567	3. 0	62·1	62·0
0. 42	15. 5	3. 31	·1438	2. 39	·02572	6. 0	63·0	63·5
0. 47	14. 30	3. 42	·1435	4. 38	·02592	9. 0	63·1	63·4
1. 9	16. 15	4. 30	·1440	5. 20	·02617	18. 0	63·5	63·1
1. 32	16. 0	4. 41	·1437	5. 50	·02610	19. 0	63·2	63·1
1. 48	15. 0	4. 52	·1437	5. 56	·02637	21. 0	63·4	63·0
2. 0	15. 0	5. 3	·1434	5. 59	·02610	22. 0	63·6	63·4
2. 32	10. 0	5. 20	·1438	6. 3	·02610	23. 0	64·2	63·6
2. 51	12. 5	5. 50	·1439	6. 14	·02580			
3. 2	13. 0	5. 55	·1462	6. 22	·02595			
3. 11	12. 45	6. 0	·1457	6. 35	·02603			
3. 13	13. 10	6. 2	·1459	6. 58	·02583			
3. 23	12. 25	6. 11	·1442	7. 21	·02576			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Sept. 30		Sept. 30		Sept. 30				
h m	° ′ ″	h m		h m		h m	°	°
3. 30	20. 12. 50	6. 20	·1459	7. 35	·02590			
3. 38	12. 0	6. 30	·1464	7. 47	·02580			
3. 49	12. 25	7. 2	·1446	7. 59	·02573			
3. 52	13. 0	7. 14	·1434	8. 2	·02580			
4. 18	13. 20	7. 32	·1443	8. 19	·02570			
4. 32	13. 0	7. 42	·1436	8. 40	·02570			
4. 42	12. 0	7. 52	·1440	8. 50	·02572			
4. 52	11. 45	8. 2	·1449	9. 5	·02567			
4. 56	11. 15	8. 16	·1439	9. 40	·02545			
5. 1	11. 30	8. 34	·1438	9. 58	·02523			
5. 9	10. 50	9. 8	·1451	10. 15	·02540			
5. 28	11. 10	9. 21	·1445	10. 31	·02510			
5. 52	9. 35	9. 39	·1462	10. 39	·02518			
5. 53	7. 20	9. 53	·1452	10. 45	·02507			
5. 58	8. 0	10. 3	·1438	11. 18	·02505			
6. 1	20. 3. 50	10. 26	·1431	11. 37	·02512			
6. 6	19. 55. 0	10. 37	·1416	11. 46	·02495			
6. 12	51. 15	10. 46	·1432	12. 0	·02500			
6. 20	51. 50	10. 56	·1438	12. 14	·02450			
6. 39	19. 21. 10	11. 12	·1435	12. 25	·02420			
6. 48	20. 2. 50	11. 30	·1429	12. 29	·02435			
7. 7	7. 5	11. 43	·1439	12. 37	·02415			
7. 18	5. 30	11. 58	·1423	12. 41	·02318			
7. 28	7. 0	12. 10	·1426	12. 49	·02270			
7. 41	9. 55	12. 20	·1407	12. 57	·02290			
7. 58	8. 20	12. 24	·1409	12. 59	·02270			
8. 9	8. 30	12. 32	·1399	13. 3	·02292			
8. 13	7. 35	12. 35	·1403	13. 13	·02364			
8. 18	8. 0	12. 38	·1401	13. 20	·02354			
8. 42	5. 5	12. 42	·1410	13. 38	·02395			
8. 52	2. 20	12. 50	·1394	13. 55	·02320			
9. 1	1. 0	13. 8	·1433	13. 59	·02330			
9. 10	20. 0. 30	13. 10	·1423	14. 5	·02311			
9. 30	19. 53. 50	13. 14	·1430	14. 10	·02308			
9. 44	53. 0	13. 27	·1417	14. 15	·02310			
10. 1	19. 55. 5	13. 32	·1425	14. 30	·02265			
10. 28	20. 8. 0	13. 37	·1423	14. 37	·02235			
10. 51	19. 59. 30	13. 43	·1435	14. 45	·02267			
11. 8	20. 3. 0	13. 52	·1426	14. 50	·02275			
11. 19	3. 5	13. 55	·1428	14. 58	·02265			
11. 32	2. 20	14. 0	·1419	15. 11	·02274			
11. 45	3. 30	14. 2	·1422	15. 21	·02265			
11. 57	0. 50	14. 8	·1419	15. 29	·02245			
12. 7	20. 1. 0	14. 20	·1423	15. 40	·02290			
12. 28	19. 55. 45	14. 30	·1406	15. 48	·02303			
12. 41	20. 1. 5	14. 36	·1408	15. 56	·02257			
12. 42	13. 5	14. 40	·1394	16. 8	·02345			
12. 58	14. 20	14. 53	·1417	16. 15	·02361			
13. 1	20. 6. 20	15. 0	·1410	16. 25	·02350			
13. 6	19. 58. 30	15. 12	·1404	16. 35	·02265			
13. 11	58. 50	15. 23	·1388	16. 43	·02278			
13. 13	55. 35	15. 28	·1391	16. 49	·02220			
13. 27	19. 57. 10	15. 32	·1388	16. 59	·02260			
13. 37	20. 0. 50	15. 47	·1408	17. 8	·02273			
13. 49	20. 5. 35	15. 57	·1405	17. 15	·02240			
14. 2	19. 59. 40	16. 3	·1379	17. 22	·02280			
14. 7	55. 45	16. 17	·1391	17. 39	·02310			
14. 18	50. 30	16. 29	·1416	17. 42	·02340			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Sept.30		Sept.30		Sept.30				
h m	° ′ ″	h m		h m		h m	°	°
14. 32	19. 55. 15	16. 39	·1418	17. 51	·02325			
14. 52	38. 30	16. 45	·1412	18. 0	·02320			
15. 11	49. 45	16. 57	·1391	18. 15	·02340			
15. 20	52. 0	17. 3	·1400	18. 35	·02310			
15. 27	51. 0	17. 9	·1396	18. 44	·02310			
15. 37	50. 20	17. 16	·1402	18. 58	·02310			
15. 42	45. 10	17. 23	·1394	19. 9	·02338			
15. 58	19. 48. 45	17. 30	·1399	19. 33	·02330			
16. 7	20. 1. 30	17. 34	·1394	19. 49	·02370			
16. 11	3. 0	17. 48	·1394	19. 56	·02381			
16. 30	33. 40	17. 57	·1419	20. 3	·02373			
16. 35	36. 50	18. 7	·1426	20. 11	·02395			
16. 39	40. 10	18. 11	·1421	20. 15	·02390			
16. 42	34. 55	18. 20	·1427	20. 27	·02390			
16. 46	31. 30	18. 28	·1436	20. 38	·02430			
16. 49	28. 10	18. 37	·1423	20. 58	·02445			
16. 52	30. 25	18. 41	·1410	22. 19	·02560			
16. 57	25. 20	18. 59	·1391	23. 0	·02611			
16. 58	19. 55	19. 9	·1389	23. 12	·02650			
17. 4	14. 25	19. 23	·1399	23. 18	·02638			
17. 11	15. 55	19. 45	·1360	23. 28	·02660			
17. 13	15. 30	19. 53	·1366	23. 35	·02670			
17. 18	16. 10	20. 2	·1356	23. 59	·02678			
17. 30	8. 50	20. 13	·1362					
17. 41	12. 30	20. 20	·1371					
17. 57	24. 10	20. 23	·1362					
18. 2	25. 25	20. 32	·1357					
18. 5	24. 50	20. 50	·1365					
18. 12	27. 30	21. 0	·1358					
18. 19	28. 0	21. 15	·1366					
18. 24	32. 5	21. 22	·1362					
18. 31	34. 30	21. 37	·1368					
18. 38	35. 10	21. 40	·1364					
18. 50	34. 0	21. 49	·1371					
19. 0	35. 55	21. 50	·1367					
19. 18	36. 0	22. 7	·1384					
19. 22	37. 10	22. 32	·1390					
19. 50	31. 15	22. 39	·1379					
20. 10	37. 55	22. 49	·1384					
20. 20	32. 40	22. 52	·1378					
20. 22	31. 5	22. 59	·1383					
20. 28	33. 0	23. 0	·1381					
20. 31	30. 20	23. 3	·1386					
20. 32	30. 45	23. 14	·1392					
20. 40	26. 55	23. 20	·1380					
20. 50	25. 20	23. 42	·1403					
20. 55	26. 5	23. 50	·1403					
20. 59	26. 40		(†)					
21. 3	25. 0							
21. 17	23. 0							
21. 22	23. 55							
21. 28	22. 20							
21. 38	21. 0							
21. 42	21. 45							
22. 3	18. 25							
22. 12	20. 5							
22. 27	21. 5							
22. 32	22. 30							

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Sept.30								
h m	° ′ ″	h m		h m		h m	°	°
22. 39	20. 20. 50							
22. 45	22. 35							
22. 52	20. 55							
22. 58	21. 50							
23. 2	20. 20							
23. 14	21. 20							
23. 17	22. 15							
23. 21	19. 40							
23. 33	17. 45							
23. 42	19. 0							
23. 50	20. 0							
23. 59	22. 20							
Oct. 19		Oct. 19		Oct. 19		Oct. 19		
0. 0	20. 18. 5	0. 0	·1444	0. 0	·02092	0. 0	60 ·2	60 ·5
0. 17	18. 0	0. 20	·1441	0. 22	·02100	1. 0	60 ·4	60 ·6
0. 21	18. 20	0. 26	·1447	0. 31	·02095	2. 0	60 ·5	60 ·6
0. 32	16. 0	0. 44	·1437	1. 2	·02122	3. 0	60 ·7	60 ·7
0. 40	14. 40	1. 7	·1445	1. 10	·02100	6. 0	60 ·6	60 ·6
1. 2	15. 50	1. 13	·1432	1. 20	·02124	9. 0	60 ·5	60 ·9
1. 11	13. 15	1. 29	·1441	2. 18	·02156	21. 0	59 ·8	59 ·1
1. 28	14. 45	2. 5	·1444	3. 2	·02164	22. 0	59 ·5	59 ·1
2. 42	13. 50	2. 33	·1451	3. 54	·02199	23. 0	59 ·9	59 ·4
2. 47	14. 25	2. 42	·1449	4. 30	·02257			
3. 2	13. 0	2. 53	·1453	4. 55	·02336			
3. 13	15. 20	3. 3	·1453	5. 11	·02410			
3. 23	13. 50	3. 7	·1450	5. 19	·02416			
3. 32	15. 45	3. 20	·1462	5. 33	·02375			
3. 44	15. 25	3. 31	·1451	5. 50	·02374			
3. 49	15. 0	3. 38	·1470	6. 5	·02354			
4. 13	19. 0	3. 48	·1468	6. 16	·02360			
4. 28	13. 40	4. 2	·1442	6. 27	·02340			
4. 38	20. 3. 50	4. 13	·1454	6. 38	·02370			
4. 41	19. 59. 5	4. 40	·1418	6. 40	·02347			
4. 52	57. 35	4. 53	·1429	6. 42	·02358			
4. 59	55. 40	5. 0	·1426	6. 51	·02340			
5. 2	19. 58. 0	5. 7	·1431	7. 0	·02345			
5. 12	20. 2. 0	5. 11	·1429	7. 7	·02345			
5. 20	9. 45	5. 20	·1436	7. 15	·02330			
5. 22	9. 20	5. 28	·1424	7. 30	·02316			
5. 32	15. 0	5. 32	·1424	7. 49	·02330			
5. 39	14. 5	5. 39	·1416	8. 15	·02333			
5. 44	13. 45	5. 47	·1418	8. 25	·02330			
5. 49	12. 45	5. 52	·1431	8. 40	·02350			
5. 51	14. 20	6. 2	·1423	8. 53	·02352			
6. 1	11. 30	6. 13	·1441	9. 3	·02338			
6. 15	15. 35	6. 32	·1405	9. 28	·02320			
6. 31	20. 0. 0	6. 35	·1411	9. 52	·02282			
6. 39	19. 58. 45	6. 42	·1403	10. 10	·02251			
6. 45	20. 0. 15	6. 52	·1415	10. 14	·02258			
6. 52	7. 5	6. 58	·1410	10. 20	·02230			
6. 53	6. 20	7. 2	·1413	10. 30	·02220			
7. 2	12. 45	7. 12	·1393	10. 33	·02230			
7. 9	11. 20	7. 30	·1403	10. 49	·02193			
7. 16	7. 15	7. 35	·1403	11. 0	·02215			
7. 22	5. 45	7. 48	·1410	11. 18	·02233			
7. 28	6. 50	8. 8	·1413	11. 26	·02210			
7. 39	7. 10	8. 18	·1406	11. 37	·02230			

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Oct. 19		Oct. 19		Oct. 19				
h m	° ′ ″	h m		h m		h m	°	°
7. 52	20. 12. 45	8. 26	·1405	11. 50	·02171			
8. 12	14. 30	8. 34	·1410	11. 59	·02168			
8. 22	11. 55	8. 47	·1411	12. 5	·02157			
8. 29	6. 40	8. 53	·1405	12. 15	·02152			
8. 33	4. 50	9. 10	·1399	12. 25	·02137			
8. 46	7. 0	9. 22	·1404	12. 37	·02134			
9. 1	20. 3. 45	9. 26	·1412	12. 50	·02160			
9. 13	19. 55. 10	9. 33	·1409	13. 17	·02153			
9. 21	54. 55	9. 40	·1412	13. 28	·02125			
9. 22	53. 50	9. 41	·1410	13. 39	·02140			
9. 31	19. 58. 20	9. 49	·1413	13. 49	·02132			
9. 48	20. 3. 20	9. 53	·1426	14. 2	·02145			
9. 55	19. 56. 50	10. 2	·1428	14. 10	·02135			
10. 0	19. 56. 50	10. 7	·1418	14. 25	·02150			
10. 8	20. 0. 50	10. 14	·1429	14. 59	·02110			
10. 16	1. 20	10. 21	·1425	15. 20	·02090			
10. 20	20. 2. 0	10. 30	·1429	15. 45	·02091			
10. 27	19. 58. 5	10. 32	·1423	15. 58	·02100			
10. 39	20. 3. 15	10. 41	·1397	16. 23	·02102			
10. 52	19. 56. 50	10. 47	·1395	17. 15	·02110			
11. 0	20. 6. 15	10. 57	·1404	17. 28	·02121			
11. 13	19. 58. 45	11. 2	·1407	17. 40	·02115			
11. 23	20. 2. 30	11. 19	·1439	17. 52	·02125			
11. 34	19. 57. 20	11. 31	·1462	18. 8	·02125			
11. 43	58. 45	11. 36	·1461	18. 34	·02131			
11. 49	58. 5	11. 43	·1438	18. 59	·02127			
12. 2	59. 50	11. 48	·1435	19. 26	·02130			
12. 25	54. 15	11. 52	·1437	20. 10	·02112			
12. 42	57. 50	12. 0	·1426	21. 12	·02098			
12. 47	19. 57. 35	12. 7	·1426	21. 59	·02095			
12. 55	20. 1. 25	12. 22	·1406	22. 38	·02090			
12. 58	0. 50	12. 32	·1403	23. 33	·02098			
13. 2	20. 1. 20	12. 58	·1412	23. 59	·02110			
13. 22	19. 54. 30	13. 3	·1410					
13. 32	56. 20	13. 12	·1412					
13. 40	54. 45	13. 18	·1421					
13. 52	56. 30	13. 22	·1418					
14. 0	19. 55. 40	13. 31	·1423					
14. 30	20. 3. 0	13. 46	·1413					
14. 37	3. 10	13. 57	·1417					
14. 52	20. 2. 0	14. 2	·1420					
15. 5	19. 58. 50	14. 12	·1436					
15. 32	20. 1. 10	14. 18	·1440					
15. 40	1. 15	14. 25	·1442					
16. 0	3. 45	14. 40	·1435					
16. 8	3. 5	14. 57	·1434					
16. 17	5. 0	15. 3	·1431					
16. 23	5. 0	15. 12	·1434					
16. 32	6. 25	15. 38	·1430					
17. 7	6. 40	15. 55	·1431					
17. 13	6. 0	16. 7	·1427					
17. 29	7. 25	16. 17	·1431					
17. 42	6. 20	16. 36	·1428					
18. 12	7. 0	16. 58	·1421					
18. 22	8. 45	17. 32	·1428					
18. 43	10. 0	17. 43	·1426					
18. 51	9. 55	18. 2	·1428					
19. 2	10. 20	18. 18	·1420					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Oct. 19		Oct. 19						
h m	° ′ ″	h m		h m		h m	°	°
19. 12	20. 12. 20	18. 42	·1419					
19. 18	12. 35	19. 6	·1415					
19. 23	12. 5	19. 14	·1420					
19. 31	13. 20	19. 22	·1418					
19. 40	12. 45	19. 32	·1423					
19. 50	13. 50	19. 38	·1421					
19. 55	15. 20	19. 55	·1424					
20. 8	13. 45	20. 12	·1420					
20. 12	12. 20	20. 22	·1424					
20. 21	12. 0	21. 2	·1418					
20. 29	11. 0	21. 17	·1412					
20. 46	13. 0	21. 25	·1416					
20. 57	12. 50	21. 32	·1411					
21. 2	13. 25	21. 41	·1414					
21. 16	11. 20	21. 51	·1410					
21. 22	12. 35	22. 0	·1408					
21. 29	11. 20	22. 7	·1411					
21. 37	11. 40	22. 18	·1407					
21. 50	13. 40	22. 34	·1410					
21. 57	13. 40	22. 42	·1406					
22. 3	15. 0	22. 52	·1406					
22. 18	15. 0	22. 58	·1410					
22. 33	17. 5	23. 26	·1417					
22. 56	17. 10	23. 52	·1419					
23. 2	16. 0	23. 59	·1425					
23. 7	16. 40							
23. 30	15. 55							
23. 42	14. 20							
23. 54	13. 50							
23. 59	14. 25							
Oct. 22		Oct. 22		Oct. 22		Oct. 22		
0. 0	20. 17. 45	0. 0	·1435	0. 0	·02255	0. 0	61 ·1	61 ·4
0. 11	18. 20	0. 32	·1422	0. 22	·02255	1. 0	60 ·6	61 ·2
0. 25	18. 40	0. 47	·1430	0. 41	·02270	3. 0	61 ·2	61 ·5
0. 38	16. 25	0. 50	·1426	1. 11	·02282	6. 0	61 ·1	61 ·3
0. 47	18. 20	0. 58	·1431	1. 40	·02280	7. 0	61 ·1	61 ·3
0. 52	18. 40	1. 1	·1427	2. 0	·02305	8. 0	60 ·9	61 ·1
0. 59	17. 25	1. 5	·1431	2. 18	·02305	9. 0	60 ·8	61 ·3
1. 10	17. 55	1. 7	·1427	2. 28	·02325	10. 0	61 ·0	61 ·3
1. 12	17. 0	1. 12	·1430	2. 29	·02322	21. 0	61 ·1	61 ·5
1. 17	18. 20		***	2. 40	·02380	22. 0	60 ·9	61 ·1
1. 27	19. 20	1. 30	·1422	2. 47	·02360	23. 0	60 ·8	61 ·2
1. 32	18. 0	1. 40	·1420	2. 50	·02387			
1. 46	16. 10	1. 48	·1427	2. 55	·02378			
1. 52	15. 25	1. 50	·1426	2. 59	·02398			
2. 8	17. 20	2. 2	·1438	3. 7	·02390			
2. 23	17. 45	2. 13	·1430	3. 20	·02399			
2. 28	16. 30	2. 22	·1434	3. 28	·02385			
2. 39	21. 55	2. 34	·1460	3. 35	·02405			
2. 47	14. 25	2. 42	·1434	3. 42	·02395			
2. 50	13. 50	2. 52	·1462	3. 50	·02402			
2. 58	20. 55	2. 59	·1454	3. 58	·02390			
3. 3	22. 20	3. 5	·1425	4. 9	·02385			
3. 11	16. 35	3. 14	·1438	4. 19	·02411			
3. 17	15. 25	3. 22	·1424	4. 21	·02400			
3. 22	17. 10	3. 31	·1440	4. 33	·02430			
3. 29	13. 55	3. 39	·1425	4. 43	·02407			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Oct. 22		Oct. 22		Oct. 22				
h m	° ′ ″	h m		h m		h m	°	°
3. 37	20. 18. 20	3. 43	·1434	4. 49	·02422			
3. 46	13. 15	3. 52	·1424	5. 5	·02390			
3. 52	16. 35	3. 54	·1426	5. 17	·02390			
3. 54	15. 5	4. 7	·1405	5. 30	·02363			
4. 3	18. 0	4. 15	·1414	5. 37	·02367			
4. 17	10. 45	4. 18	·1411	5. 50	·02347			
4. 20	10. 10	4. 31	·1431	6. 0	·02342			
4. 28	5. 45	4. 37	·1426	6. 19	·02350			
4. 32	7. 40	4. 49	·1452	6. 36	·02342			
4. 39	6. 50	4. 59	·1432	6. 41	·02320			
4. 42	3. 20	5. 15	·1453	7. 11	·02356			
4. 47	1. 55	5. 21	·1450	7. 29	·02350			
5. 0	9. 10	5. 27	·1446	7. 39	·02312			
5. 7	4. 30	5. 33	·1456	7. 47	·02330			
5. 12	3. 0	5. 38	·1453	7. 50	·02325			
5. 27	5. 0	5. 48	·1428	7. 58	·02335			
5. 32	3. 45	5. 58	·1418	8. 11	·02310			
5. 47	8. 0	6. 9	·1434	8. 28	·02286			
5. 52	3. 0	6. 18	·1456	8. 39	·02283			
5. 58	20. 2. 20	6. 29	·1443	8. 58	·02303			
6. 3	19. 56. 0	6. 39	·1413	9. 3	·02283			
6. 13	51. 50	6. 51	·1421	9. 13	·02287			
6. 27	19. 59. 50	7. 2	·1426	9. 18	·02245			
6. 30	20. 0. 5	7. 10	·1419	9. 20	·02251			
6. 39	20. 5. 55	7. 26	·1435	9. 30	·02190			
6. 48	19. 58. 20	7. 37	·1424	9. 46	·02100			
6. 52	57. 30	7. 45	·1428	9. 52	·02150			
6. 59	19. 58. 25	7. 57	·1451	10. 0	·02181			
7. 11	20. 6. 0	8. 6	·1440	10. 15	·02200			
7. 19	3. 5	8. 13	·1437	10. 19	·02180			
7. 27	9. 50	8. 26	·1420	10. 30	·02158			
7. 31	11. 0	8. 33	·1404	10. 43	·02208			
7. 42	2. 50	8. 40	·1413	10. 59	·02220			
7. 47	20. 3. 0	8. 42	·1408	11. 6	·02212			
7. 53	19. 55. 20	8. 55	·1418	11. 16	·02217			
8. 7	20. 2. 25	8. 58	·1416	11. 33	·02199			
8. 10	1. 10	9. 9	·1454	11. 39	·02202			
8. 22	1. 45	9. 12	·1446	11. 43	·02190			
8. 30	0. 30	9. 25	·1466	11. 54	·02190			
8. 34	20. 0. 55	9. 31	·1446	12. 0	·02179			
8. 41	19. 56. 10	9. 37	·1442	12. 8	·02183			
8. 49	58. 55	9. 42	·1406	12. 18	·02161			
8. 57	57. 50	9. 48	·1395	12. 24	·02132			
9. 2	59. 10	10. 0	·1430	12. 26	·02140			
9. 7	19. 58. 20	10. 12	·1449	12. 39	·02083			
9. 17	20. 3. 25	10. 31	·1406	12. 50	·02103			
9. 22	0. 10	10. 32	·1409	13. 5	·02090			
9. 30	7. 25	10. 42	·1423	13. 27	·02100			
9. 38	8. 20	10. 57	·1424	13. 38	·02080			
9. 47	14. 45	11. 1	·1422	14. 8	·02060			
9. 56	2. 30	11. 17	·1429	14. 28	·02108			
10. 0	0. 45	11. 22	·1423	14. 39	·02105			
10. 8	2. 0	11. 30	·1420	14. 50	·02112			
10. 13	2. 25	11. 33	·1422	15. 10	·02130			
10. 28	20. 10. 50	11. 41	·1414	15. 38	·02172			
10. 40	19. 59. 55	11. 53	·1421	15. 50	·02160			
10. 47	56. 55	11. 58	·1417	16. 46	·02132			
10. 52	57. 0	12. 7	·1424	16. 59	·02120			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Oct. 22		Oct. 22		Oct. 22				
h m	° ′ ″	h m		h m		h m	°	°
11. 3	19. 56. 20	12. 12	·1424	17. 5	·02090			
11. 12	56. 0	12. 18	·1417	17. 18	·02110			
11. 20	57. 15	12. 27	·1428	17. 26	·02090			
11. 28	56. 40	12. 33	·1415	17. 31	·02100			
11. 32	58. 20	12. 39	·1418	17. 38	·02118			
11. 59	59. 20	12. 52	·1435	17. 43	·02108			
12. 7	58. 0	13. 0	·1431	17. 47	·02122			
12. 11	58. 5	13. 7	·1425	17. 55	·02107			
12. 17	56. 30	13. 18	·1433	18. 7	·02122			
12. 26	59. 30	13. 29	·1449	18. 39	·02158			
12. 33	56. 5	13. 37	·1446	18. 45	·02172			
12. 40	49. 0	13. 39	·1442	18. 49	·02164			
12. 44	47. 0	13. 45	·1446	18. 59	·02182			
13. 4	56. 0	13. 56	·1444	19. 23	·02180			
13. 22	53. 0	14. 3	·1435	19. 39	·02205			
13. 30	53. 50	14. 12	·1431	19. 50	·02208			
13. 38	51. 40	14. 23	·1434	19. 59	·02221			
13. 49	52. 5	14. 31	·1428	20. 5	·02220			
13. 52	52. 0	14. 40	·1426	20. 14	·02238			
13. 58	53. 25	14. 51	·1422	20. 45	·02247			
14. 2	52. 55	14. 59	·1426	21. 12	·02257			
14. 13	54. 55	15. 8	·1427	21. 54	·02283			
14. 28	59. 20	15. 26	·1421	22. 5	·02280			
14. 37	59. 0	15. 38	·1424	22. 19	·02301			
14. 48	58. 10	15. 43	·1430	22. 28	·02283			
14. 52	56. 30	15. 48	·1428	22. 40	·02320			
15. 7	19. 56. 30	15. 56	·1434	22. 45	·02330			
15. 35	20. 5. 15	16. 0	·1442	22. 58	·02342			
15. 43	9. 0	16. 6	·1444	23. 18	·02434			
15. 56	5. 50	16. 14	·1457	23. 19	·02420			
16. 0	7. 50	16. 21	·1462	23. 27	·02430			
16. 4	6. 25	16. 30	·1457	23. 30	·02410			
16. 5	5. 20	16. 42	·1460	23. 33	·02420			
16. 20	4. 35	17. 5	·1423	23. 38	·02405			
16. 28	6. 20	17. 11	·1416	23. 59	·02400			
16. 40	7. 0	17. 19	·1424					
16. 51	10. 25	17. 27	·1440					
16. 59	14. 20	17. 34	·1436					
17. 3	20. 30	17. 41	·1426					
17. 12	19. 40	17. 48	·1433					
17. 18	20. 50	17. 52	·1430					
17. 22	21. 45	17. 57	·1433					
17. 24	22. 40	18. 0	·1438					
17. 32	20. 45	18. 3	·1431					
17. 37	21. 30	18. 10	·1437					
17. 42	21. 0	18. 20	·1434					
17. 46	23. 20	18. 27	·1430					
17. 54	23. 20	18. 32	·1433					
17. 59	25. 40	18. 40	·1437					
18. 3	21. 55	18. 50	·1433					
18. 8	23. 0	18. 56	·1437					
18. 13	22. 0	18. 59	·1426					
18. 20	23. 0	19. 3	·1429					
18. 23	21. 20	19. 9	·1427					
18. 32	19. 45	19. 22	·1416					
18. 37	20. 10	19. 38	·1406					
18. 42	19. 0	19. 52	·1412					
18. 53	20. 40	19. 58	·1409					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Oct. 22		Oct. 22						
h m	° ′ ″	h m		h m		h m	°	°
19. 1	20. 19. 5	20. 4	·1406					
19. 18	20. 0	20. 10	·1412					
19. 30	16. 25	20. 20	·1400					
19. 42	13. 15	20. 27	·1402					
19. 49	14. 0	20. 42	·1389					
19. 53	13. 20		***					
19. 59	14. 45	21. 5	·1383					
20. 3	13. 40	21. 38	·1381					
20. 11	14. 45	21. 57	·1385					
20. 13	13. 45	22. 10	·1384					
20. 20	14. 45	22. 25	·1388					
20. 37	22. 45	22. 31	·1374					
20. 39	21. 45	22. 42	·1397					
20. 45	23. 50	22. 48	·1388					
20. 48	23. 10	22. 51	·1391					
20. 53	24. 0	23. 3	·1376					
21. 0	21. 30	23. 10	·1389					
21. 2	22. 50	23. 27	·1399					
21. 17	21. 25	23. 40	·1394					
21. 27	19. 40	23. 42	·1401					
21. 31	17. 10	23. 59	·1400					
21. 32	17. 50							
21. 40	16. 30							
21. 46	15. 40							
21. 51	16. 5							
21. 57	15. 25							
22. 13	16. 55							
22. 22	19. 10							
22. 31	14. 5							
22. 34	19. 30							
22. 42	18. 45							
22. 47	19. 30							
23. 2	15. 30							
23. 4	16. 55							
23. 11	15. 50							
23. 16	17. 40							
23. 20	16. 0							
23. 25	14. 45							
23. 32	16. 15							
23. 37	15. 5							
23. 43	15. 40							
23. 59	15. 45							
Oct. 24		Oct. 24		Oct. 24		Oct. 24		
0. 0	20. 15. 0	0. 0	·1397	0. 0	·02280	0. 0	60·8	61·2
0. 7	16. 5	0. 13	·1403	0. 25	·02291	1. 0	60·7	61·0
0. 22	14. 55	0. 22	·1410	1. 0	·02265	2. 0	60·6	61·0
0. 28	15. 50	0. 37	·1410	1. 10	·02283	3. 0	60·7	61·2
0. 34	15. 40	0. 47	·1414	1. 20	·02267	6. 0	61·2	61·7
0. 49	13. 50	1. 7	·1432	1. 32	·02266	9. 0	61·4	62·4
0. 52	12. 40	1. 19	·1422	1. 50	·02285	21. 30	60·1	60·7
1. 0	13. 40	1. 27	·1423	2. 3	·02267			
1. 3	12. 10	1. 40	·1435	2. 9	·02272			
1. 13	16. 20	1. 47	·1434	2. 29	·02264			
1. 22	14. 55	2. 0	·1425	2. 42	·02277			
1. 50	17. 35	2. 22	·1427	2. 57	·02260			
2. 1	15. 30	2. 37	·1432	3. 20	·02352			
2. 7	16. 25	2. 47	·1410	3. 29	·02327			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Oct. 24		Oct. 24		Oct. 24				
h m	° ′ ″	h m		h m		h m	°	°
2. 33	20. 15. 15	2. 57	·1423	3. 40	·02318			
2. 41	16. 50	3. 0	·1420	3. 48	·02370			
2. 54	10. 0	3. 13	·1444	3. 59	·02347			
3. 2	9. 20	3. 20	·1432	4. 8	·02340			
3. 14	2. 20	3. 32	·1405	4. 13	·02345			
3. 21	3. 50	3. 47	·1445	4. 29	·02324			
3. 23	1. 45	4. 0	·1443	4. 40	·02348			
3. 27	2. 50	4. 10	·1451	4. 48	·02335			
3. 32	20. 0. 40	4. 16	·1447	5. 0	·02350			
3. 43	19. 52. 10	4. 23	·1428	5. 8	·02355			
4. 2	19. 59. 40	4. 36	·1435	5. 15	·02347			
4. 12	20. 1. 40	4. 47	·1426	5. 33	·02352			
4. 26	10. 0	4. 58	·1432	5. 48	·02345			
4. 33	6. 20	5. 0	·1430	5. 58	·02352			
4. 46	8. 0	5. 5	·1433	6. 17	·02340			
4. 58	5. 25	5. 14	·1425	6. 22	·02355			
5. 19	7. 0	5. 30	·1436	6. 35	·02323			
5. 28	5. 5	5. 38	·1430	6. 39	·02347			
5. 38	6. 55	5. 48	·1428	6. 41	·02338			
5. 52	6. 5	5. 56	·1436	6. 47	·02349			
5. 55	4. 0	5. 58	·1433	6. 51	·02338			
6. 2	7. 20	6. 0	·1437	6. 59	·02337			
6. 7	7. 25	6. 9	·1431	7. 8	·02310			
6. 17	2. 5	6. 17	·1456	7. 19	·02325			
6. 27	20. 8. 45	6. 26	·1421	7. 38	·02290			
6. 33	19. 59. 0	6. 32	·1445	7. 59	·02309			
6. 38	20. 0. 0	6. 40	·1460	8. 19	·02315			
6. 42	19. 58. 25	6. 49	·1459	8. 25	·02330			
6. 47	20. 1. 35	6. 58	·1447	8. 32	·02287			
6. 57	6. 10	7. 12	·1470	8. 41	·02270			
7. 7	1. 15	7. 20	·1452	8. 49	·02272			
7. 22	11. 10	7. 31	·1436	9. 0	·02260			
7. 30	10. 45	7. 53	·1449	9. 18	·02228			
7. 43	6. 15	8. 2	·1446	9. 29	·02240			
8. 8	8. 5	8. 20	·1487	9. 40	·02258			
8. 22	1. 10	8. 30	·1466	9. 50	·02243			
8. 30	8. 0	8. 42	·1477	10. 0	·02270			
8. 40	1. 20	9. 0	·1457	10. 10	·02260			
9. 0	11. 40	9. 10	·1425	10. 21	·02280			
9. 3	11. 0	9. 18	·1433	10. 40	·02270			
9. 12	20. 13. 0	9. 23	·1434	10. 49	·02272			
9. 22	19. 59. 20	9. 38	·1461	11. 9	·02258			
9. 40	44. 25	9. 46	·1454	11. 30	·02225			
9. 49	47. 50	9. 50	·1455	11. 46	·02207			
9. 56	19. 49. 0	9. 55	·1451	12. 8	·02227			
10. 10	20. 0. 25	10. 10	·1424	12. 20	·02218			
10. 20	19. 56. 50	10. 20	·1430	12. 29	·02208			
10. 32	20. 0. 25	10. 31	·1422	12. 39	·02215			
10. 42	19. 58. 5	10. 43	·1434	12. 42	·02238			
10. 57	20. 2. 25	10. 55	·1428	12. 51	·02243			
11. 2	1. 50	11. 12	·1433	13. 7	·02180			
11. 10	1. 20	11. 22	·1426	13. 18	·02176			
11. 13	2. 0	11. 28	·1426	13. 30	·02200			
11. 22	20. 1. 45	11. 32	·1423	13. 49	·02195			
11. 48	19. 58. 15	11. 37	·1424	14. 0	·02207			
12. 0	19. 59. 20	11. 42	·1420	14. 7	·02220			
12. 9	20. 4. 50	11. 53	·1422	14. 10	·02214			
12. 13	7. 50	11. 58	·1419	14. 17	·02230			

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Oct. 24		Oct. 24		Oct. 24				
h m	° ′ ″	h m		h m		h m	°	°
12. 22	20. 8. 30	12. 9	·1416	14. 21	·02212			
12. 28	6. 50	12. 15	·1416	14. 30	·02203			
12. 44	5. 45	12. 23	·1406	14. 38	·02210			
12. 52	8. 0	12. 40	·1417	14. 50	·02197			
13. 3	15. 40	12. 59	·1451	15. 5	·02196			
13. 10	12. 20	13. 10	·1433	15. 18	·02208			
13. 14	7. 35	13. 32	·1446	15. 23	·02205			
13. 32	3. 15	13. 46	·1442	15. 43	·02230			
13. 40	4. 55	13. 54	·1434	15. 59	·02228			
13. 49	5. 0	14. 0	·1436	16. 11	·02240			
13. 58	6. 0	14. 3	·1431	16. 46	·02241			
14. 0	4. 40	14. 10	·1436	17. 10	·02240			
14. 7	6. 40	14. 14	·1431	17. 16	·02247			
14. 10	6. 15	14. 21	·1436	17. 25	·02235			
14. 23	10. 0	14. 32	·1437	17. 45	·02247			
14. 37	6. 20	14. 33	·1435	18. 10	·02232			
14. 57	7. 0	14. 50	·1442	18. 38	·02220			
15. 23	10. 20	15. 0	·1435	18. 48	·02228			
15. 33	8. 40	15. 20	·1431	19. 19	·02215			
15. 42	8. 0	15. 27	·1426	19. 40	·02212			
15. 57	11. 25	15. 33	·1428	20. 19	·02202			
16. 2	11. 0	15. 51	·1436	20. 25	·02210			
16. 13	8. 0	16. 7	·1432	20. 30	·02207			
16. 28	9. 45	16. 19	·1438	20. 40	·02212			
16. 32	9. 0		***	21. 4	·02206			
16. 43	10. 0	16. 49	·1442	21. 33	·02210			
16. 52	9. 50	16. 55	·1447	21. 43	·02210			
16. 56	9. 20	17. 0	·1443	22. 27	·02208			
17. 0	10. 0		***	22. 35	·02210			
17. 8	9. 40	17. 18	·1440	22. 45	·02195			
17. 18	11. 0	17. 21	·1445	22. 50	·02198			
17. 21	10. 5	17. 29	·1442	23. 5	·02207			
17. 24	11. 40	17. 36	·1440	23. 11	·02218			
17. 30	10. 50		***	23. 19	·02210			
17. 35	11. 25	17. 54	·1444	23. 49	·02230			
17. 40	10. 35	18. 8	·1450	23. 55	·02230			
17. 46	11. 10	18. 26	·1443	23. 59	·02240			
17. 50	12. 20	18. 31	·1448					
17. 58	12. 10	18. 47	·1438					
18. 8	10. 40	18. 57	·1444					
18. 32	11. 15	19. 10	·1438					
18. 40	12. 5	19. 32	·1424					
18. 47	10. 40		***					
18. 52	10. 15	19. 51	·1428					
19. 3	11. 15	20. 8	·1436					
19. 10	12. 55	20. 11	·1439					
19. 16	12. 30		***					
19. 21	13. 10	20. 26	·1438					
19. 27	12. 25	20. 29	·1436					
19. 38	12. 40	20. 32	·1441					
19. 42	12. 50	20. 40	·1433					
19. 59	13. 30	20. 48	·1434					
20. 7	12. 0	20. 51	·1439					
20. 10	12. 45	21. 0	·1434					
20. 13	11. 20	21. 10	·1439					
20. 18	12. 20	21. 18	·1432					
20. 22	11. 25	21. 28	·1431					
20. 27	11. 45		(†)					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Of V. F. Magnet.
Oct. 24		Oct. 24						
h m	° ′ ″	h m		h m		h m	°	°
20. 32	20. 10. 40	21. 42	·1415					
20. 37	12. 0	21. 47	·1420					
20. 42	9. 55	21. 50	·1415					
20. 48	8. 45	21. 56	·1427					
20. 53	10. 5	22. 0	·1419					
21. 2	8. 0	22. 7	·1428					
21. 15	10. 10	22. 11	·1420					
21. 22	8. 40	22. 15	·1438					
21. 34	11. 5	22. 20	·1432					
21. 49	7. 50	22. 26	·1422					
21. 52	9. 40	22. 37	·1420					
21. 58	8. 30	22. 40	·1425					
22. 7	11. 40	22. 48	·1411					
22. 10	8. 20	22. 57	·1416					
22. 13	12. 20	23. 2	·1420					
22. 20	14. 20	23. 5	·1425					
22. 24	13. 40	23. 9	·1420					
22. 40	17. 5	23. 11	·1423					
22. 48	12. 20	23. 16	·1422					
22. 55	13. 25	23. 26	·1425					
23. 28	16. 35	23. 32	·1420					
23. 34	16. 20	23. 43	·1424					
23. 46	18. 20	23. 50	·1419					
23. 52	17. 35	23. 53	·1424					
23. 57	19. 0	23. 59	·1416					
23. 59	18. 30							
Oct. 25		Oct. 25		Oct. 25		Oct. 25		
0. 0	20. 18. 25	0. 0	·1416	0. 0	·02240	0. 0	60·8	61·4
0. 12	17. 0	0. 15	·1420	0. 3	·02238	1. 0	60·7	61·3
0. 22	13. 20	0. 22	·1418	0. 30	·02275	8. 0	61·1	62·1
0. 29	14. 30	0. 39	·1425	1. 0	·02295	21. 0	61·7	62·2
0. 33	12. 40	0. 42	·1422	1. 40	·02298	22. 0	61·1	62·0
0. 38	13. 20	0. 58	·1432	2. 9	·02331	23. 0	60·7	61·4
0. 42	12. 35	1. 18	·1426	2. 17	·02323			
0. 47	13. 10	1. 24	·1434	2. 27	·02370			
0. 53	12. 40	1. 32	·1425	2. 36	·02380			
1. 10	14. 5	1. 48	·1431	2. 51	·02352			
1. 22	14. 50	1. 53	·1429	3. 2	·02373			
1. 32	17. 20	2. 2	·1433	3. 9	·02364			
1. 37	16. 25	2. 10	·1416	3. 14	·02390			
1. 53	17. 50	2. 17	·1437	3. 21	·02391			
2. 7	20. 35	2. 28	·1461	3. 28	·02383			
2. 13	11. 0	2. 47	·1431	3. 37	·02415			
2. 20	11. 25	2. 53	·1434	3. 57	·02408			
2. 23	10. 55	3. 2	·1427	4. 2	·02383			
2. 32	15. 0	3. 12	·1445	4. 20	·02358			
2. 57	14. 20	3. 17	·1443	4. 29	·02338			
3. 9	20. 6. 20	3. 22	·1451	4. 39	·02348			
3. 22	19. 59. 50	3. 31	·1440	4. 50	·02338			
3. 30	20. 3. 10	3. 37	·1438	5. 8	·02340			
3. 48	0. 20	3. 51	·1446	5. 30	·02330			
4. 10	9. 55	4. 3	·1439	5. 57	·02353			
4. 22	13. 10	4. 8	·1435	6. 4	·02357			
4. 30	10. 40	4. 14	·1438	6. 10	·02345			
4. 42	10. 20	4. 22	·1429	6. 18	·02353			
4. 52	9. 5	4. 35	·1438	6. 33	·02352			
5. 20	11. 30	4. 50	·1440	6. 40	·02350			

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol ; attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Oct. 25		Oct. 25		Oct. 25				
h m	° ′ ″	h m		h m		h m	°	°
5. 30	20. 8. 40	5. 3	·1447	6. 57	·02340			
5. 45	3. 20	5. 20	·1433	7. 28	·02342			
6. 2	20. 4. 50	5. 33	·1424	7. 33	·02350			
6. 11	19. 59. 20	5. 50	·1432	7. 43	·02320			
6. 20	56. 20	6. 7	·1420	7. 52	·02350			
6. 30	54. 0	6. 18	·1431	7. 59	·02320			
6. 39	53. 55	6. 21	·1431	8. 10	·02290			
7. 0	19. 59. 0	6. 31	·1440	9. 27	·02311			
7. 5	20. 0. 0	6. 35	·1438	11. 0	·02330			
7. 20	4. 25	6. 41	·1440	11. 9	·02315			
7. 32	5. 45	7. 3	·1428	11. 15	·02323			
7. 39	20. 1. 0	7. 9	·1429	11. 29	·02273			
7. 48	19. 40. 20	7. 22	·1422	11. 39	·02263			
7. 52	45. 35	7. 30	·1425	11. 50	·02260			
8. 1	57. 0	7. 41	·1415	12. 5	·02249			
8. 7	19. 57. 35	7. 52	·1482	12. 11	·02252			
8. 13	20. 1. 0	8. 6	·1470	12. 18	·02248			
8. 22	1. 40	8. 21	·1454	12. 30	·02257			
8. 27	4. 0	8. 41	·1423	12. 58	·02245			
8. 30	3. 20	9. 7	·1431	13. 26	·02270			
8. 33	4. 50	9. 11	·1429	13. 41	·02283			
8. 43	1. 0	9. 39	·1437	13. 57	·02275			
8. 50	0. 10	9. 42	·1436	14. 12	·02278			
9. 9	4. 50	9. 51	·1438	14. 40	·02247			
9. 15	3. 45	10. 41	·1441	14. 48	·02250			
9. 23	4. 0	11. 0	·1440	15. 0	·02230			
9. 40	6. 0	11. 12	·1448	15. 16	·02230			
10. 2	5. 55	11. 23	·1481	15. 27	·02219			
10. 15	5. 20	11. 30	·1488	15. 34	·02225			
10. 22	5. 35	11. 50	·1472	15. 43	·02227			
10. 42	4. 10	12. 2	·1463	15. 56	·02240			
10. 57	4. 0	12. 13	·1447	16. 5	·02223			
11. 17	7. 5	12. 28	·1454	16. 28	·02260			
11. 22	6. 45	12. 40	·1462	16. 45	·02272			
11. 40	11. 30	13. 19	·1434	16. 56	·02275			
11. 45	11. 0	13. 26	·1434	17. 20	·02302			
11. 52	11. 20	13. 37	·1437	17. 32	·02305			
12. 2	14. 0	13. 42	·1435	17. 48	·02320			
12. 9	13. 40	13. 53	·1442	18. 55	·02327			
12. 22	8. 15	14. 7	·1442	19. 0	·02335			
12. 27	7. 55	14. 29	·1452	19. 6	·02330			
12. 32	4. 30	14. 43	·1437	19. 15	·02337			
12. 49	9. 25	14. 50	·1437	19. 21	·02330			
12. 57	9. 25	15. 5	·1463	19. 29	·02337			
13. 14	7. 30	15. 18	·1456	19. 39	·02340			
13. 28	5. 55	15. 23	·1457	19. 48	·02333			
13. 32	5. 30	15. 37	·1446	20. 25	·02336			
13. 42	7. 50	15. 42	·1446	20. 45	·02348			
13. 51	8. 10	15. 57	·1439	21. 13	·02330			
13. 57	8. 40	16. 10	·1445	21. 29	·02330			
14. 7	6. 20	16. 23	·1436	21. 46	·02340			
14. 12	6. 10	16. 52	·1445	21. 50	·02332			
14. 20	5. 0	17. 8	·1439	21. 55	·02350			
14. 32	4. 20	17. 18	·1441	21. 58	·02330			
14. 42	6. 15	17. 23	·1439	22. 0	·02343			
14. 47	5. 30	17. 37	·1442	22. 5	·02330			
14. 57	7. 0	17. 42	·1440	22. 8	·02337			
15. 3	5. 0	18. 2	·1444	22. 13	·02330			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Oct. 25		Oct. 25		Oct. 25				
h m	° ′ ″	h m		h m		h m	°	°
15. 23	20. 6. 20	18. 27	·1438	22. 30	·02327			
15. 32	8. 0	18. 38	·1437	22. 34	·02335			
15. 39	7. 0	18. 44	·1439	22. 39	·02319			
15. 57	13. 20	19. 13	·1426	22. 47	·02338			
16. 0	15. 40	19. 22	·1420	22. 51	·02330			
16. 8	17. 10	19. 32	·1423	23. 14	·02335			
16. 27	11. 40	19. 42	·1415	23. 22	·02322			
16. 38	10. 20	19. 56	·1416	23. 37	·02332			
16. 47	10. 50	19. 59	·1419	23. 59	·02340			
16. 57	10. 10	20. 6	·1411					
17. 2	11. 0	20. 17	·1420					
17. 16	8. 45	20. 43	·1433					
17. 22	9. 10	21. 0	·1428					
17. 30	10. 5	21. 6	·1424					
17. 32	9. 45	21. 18	·1421					
17. 40	10. 5	21. 35	·1409					
17. 47	9. 30	21. 42	·1410					
18. 7	12. 20	21. 50	·1402					
18. 11	11. 50	21. 56	·1408					
18. 20	12. 25	22. 0	·1394					
18. 29	11. 20	22. 4	·1397					
18. 32	11. 35	22. 8	·1390					
18. 41	9. 45	22. 11	·1395					
18. 48	11. 25	22. 18	·1388					
19. 0	12. 10	22. 22	·1394					
19. 4	11. 30	22. 26	·1391					
19. 13	12. 30	22. 32	·1398					
19. 22	15. 20	22. 35	·1395					
19. 33	17. 20	22. 44	·1402					
19. 40	16. 55	22. 52	·1396					
19. 53	20. 0	22. 58	·1395					
19. 58	19. 0	23. 0	·1397					
20. 2	19. 55	23. 22	·1403					
20. 12	16. 15	23. 56	·1399					
20. 32	12. 55	23. 59	·1402					
20. 51	14. 50							
20. 52	14. 30							
21. 2	16. 0							
21. 21	15. 35							
21. 28	14. 45							
21. 37	15. 15							
21. 42	14. 20							
21. 49	15. 45							
21. 51	15. 5							
22. 0	19. 20							
22. 2	18. 45							
22. 9	18. 20							
22. 13	19. 15							
22. 22	20. 10							
22. 29	19. 25							
22. 32	20. 55							
22. 35	19. 35							
22. 42	20. 45							
22. 52	18. 45							
22. 59	18. 25							
23. 9	16. 55							
23. 19	16. 50							
23. 23	16. 10							

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Oct. 25								
h m	° ′ ″	h m		h m		h m	°	°
23. 32	20. 17. 35							
23. 59	17. 35							
Nov. 19		Nov. 19		Nov. 19		Nov. 19		
0. 0	20. 14. 25	0. 0	·1426	0. 0	·02141	0. 0	61·5	61·5
0. 2	13. 45	0. 2	·1430	0. 6	·02145	1. 0	61·3	61·3
0. 17	13. 50	0. 16	·1424	0. 18	·02142	3. 0	60·9	61·1
0. 21	16. 20	0. 23	·1433	0. 23	·02160	6. 0	61·4	61·4
0. 28	13. 30	0. 33	·1426	0. 29	·02150	9. 0	61·5	61·4
0. 34	13. 10	0. 47	·1426	1. 0	·02160	21. 0	60·0	60·0
0. 39	14. 0	0. 51	·1432	1. 8	·02172	22. 0	60·8	60·6
0. 42	13. 0	1. 2	·1426	1. 12	·02165	23. 0	61·0	60·8
0. 48	14. 0	1. 10	·1434	1. 29	·02170			
1. 0	12. 15		***	2. 0	·02170			
1. 3	14. 30	1. 21	·1430	2. 20	·02170			
1. 8	13. 50	1. 37	·1434	2. 26	·02164			
1. 15	13. 40	1. 39	·1431	2. 31	·02170			
1. 20	12. 40	1. 43	·1435	3. 8	·02155			
1. 23	13. 25		***	3. 26	·02155			
1. 30	13. 15	2. 0	·1431	3. 40	·02163			
1. 32	14. 5		***	3. 56	·02165			
1. 37	12. 50	2. 20	·1437	4. 1	·02155			
1. 42	14. 15	2. 23	·1433	4. 20	·02192			
1. 47	13. 20	2. 27	·1437	4. 33	·02185			
2. 22	12. 50	2. 32	·1433	4. 41	·02206			
2. 32	13. 15	2. 37	·1438	5. 1	·02210			
2. 55	11. 45	2. 40	·1434	5. 7	·02220			
3. 4	11. 50	2. 42	·1435	5. 12	·02218			
3. 20	10. 50	3. 20	·1434	6. 10	·02197			
3. 52	12. 45	3. 41	·1443	7. 2	·02205			
3. 57	13. 40	3. 50	·1436	7. 20	·02180			
4. 3	11. 0	3. 52	·1438	7. 39	·02170			
4. 7	11. 55	3. 59	·1434	7. 55	·02150			
4. 19	9. 20	4. 7	·1418	8. 5	·02162			
4. 22	9. 35	4. 16	·1411	8. 15	·02180			
4. 35	2. 55	4. 22	·1418	8. 32	·02180			
4. 39	20. 3. 20	4. 33	·1396	8. 58	·02170			
4. 47	19. 57. 20	4. 42	·1400	9. 12	·02152			
4. 52	56. 50	4. 47	·1396	9. 37	·02151			
4. 58	19. 57. 45	4. 58	·1413	9. 57	·02141			
5. 6	20. 3. 20	5. 8	·1419	10. 20	·02150			
5. 13	4. 0	5. 12	·1412	10. 28	·02155			
5. 22	3. 0	5. 20	·1410	10. 39	·02127			
5. 32	5. 0	5. 31	·1422	10. 47	·02140			
5. 50	12. 20	5. 45	·1426	10. 57	·02123			
5. 58	10. 50	5. 48	·1426	11. 21	·02133			
6. 7	14. 0	5. 58	·1417	11. 39	·02137			
6. 15	12. 0	6. 6	·1425	11. 52	·02118			
6. 22	8. 25	6. 20	·1411	12. 5	·02102			
6. 30	9. 0	6. 28	·1422	12. 18	·02110			
6. 44	20. 3. 25	6. 38	·1425	12. 28	·02095			
6. 52	19. 56. 0	6. 49	·1413	12. 39	·02090			
6. 53	56. 30	6. 57	·1431	12. 50	·02100			
6. 58	55. 0	7. 2	·1450	13. 9	·02092			
7. 1	19. 58. 15	7. 7	·1463	13. 28	·02089			
7. 8	20. 7. 20	7. 21	·1432	13. 42	·02090			
7. 13	9. 30	7. 27	·1433	13. 50	·02080			
7. 21	10. 30	7. 31	·1429	14. 9	·02091			

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Nov. 19		Nov. 19		Nov. 19				
h m	° ′ ″	h m		h m		h m	°	°
7. 27	20. 11. 35	7. 41	·1429	14. 19	·02087			
7. 33	11. 20	7. 59	·1401	14. 31	·02090			
7. 43	9. 40	8. 15	·1423	14. 38	·02090			
7. 50	20. 6. 0	8. 22	·1421	14. 49	·02092			
8. 3	19. 48. 45	8. 35	·1429	15. 13	·02110			
8. 10	46. 20	8. 39	·1426	15. 20	·02100			
8. 18	47. 0	8. 49	·1436	15. 45	·02122			
8. 22	46. 20	8. 55	·1434	15. 59	·02118			
8. 30	47. 50	8. 59	·1435	16. 5	·02125			
8. 33	49. 10	9. 17	·1416	16. 20	·02114			
8. 40	49. 25	9. 22	·1418	16. 34	·02116			
8. 48	19. 53. 50	9. 28	·1418	16. 41	·02105			
9. 1	20. 0. 40	9. 39	·1424	17. 1	·02118			
9. 20	2. 45	9. 44	·1417	17. 20	·02105			
9. 28	1. 50	9. 49	·1419	17. 30	·02105			
9. 32	2. 20	10. 1	·1413	17. 39	·02098			
9. 34	4. 0	10. 17	·1417	18. 6	·02100			
9. 41	3. 0	10. 20	·1414	18. 40	·02080			
9. 52	2. 0	10. 32	·1429	18. 49	·02090			
10. 4	0. 55	10. 38	·1430	18. 58	·02080			
10. 37	5. 45	10. 41	·1421	19. 19	·02078			
10. 49	4. 0	10. 50	·1432	19. 29	·02072			
10. 58	0. 25	10. 53	·1428	19. 34	·02079			
11. 28	5. 25	11. 0	·1432	19. 40	·02065			
11. 40	5. 40	11. 9	·1434	19. 48	·02060			
11. 48	7. 50	11. 22	·1430	19. 52	·02070			
11. 54	7. 20	11. 30	·1436	19. 58	·02058			
12. 2	8. 50	11. 40	·1450	20. 2	·02071			
12. 18	8. 0	11. 52	·1444	20. 10	·02054			
12. 27	5. 5	12. 3	·1434	20. 19	·02063			
12. 42	0. 35	12. 20	·1446	20. 23	·02051			
12. 50	1. 0	12. 30	·1446	20. 30	·02057			
12. 58	2. 55	12. 37	·1440	20. 38	·02038			
13. 13	1. 30	12. 49	·1445	20. 43	·02050			
13. 20	20. 0. 5	13. 10	·1436	20. 58	·02039			
13. 28	19. 59. 45	13. 23	·1426	21. 9	·02043			
13. 33	20. 0. 40	13. 28	·1428	21. 48	·02030			
13. 42	1. 0	13. 35	·1421	22. 15	·02039			
13. 45	2. 10	13. 38	·1422	22. 58	·02030			
13. 52	2. 25	13. 51	·1410	23. 20	·02042			
14. 2	4. 0	14. 2	·1416	23. 29	·02050			
14. 10	8. 0	14. 17	·1416	23. 59	·02060			
14. 14	8. 35	14. 25	·1419					
14. 22	8. 0	14. 30	·1417					
14. 31	10. 0	14. 42	·1424					
14. 37	9. 0	14. 48	·1421					
14. 46	9. 30	14. 57	·1422					
14. 56	7. 25	15. 4	·1420					
15. 6	9. 0	15. 11	·1424					
15. 12	8. 55	15. 21	·1411					
15. 17	10. 55	15. 52	·1427					
15. 29	8. 5	15. 53	·1425					
15. 36	9. 50	16. 4	·1433					
15. 40	9. 45	16. 7	·1431					
15. 55	12. 15	16. 12	·1435					
16. 3	10. 0	16. 20	·1431					
16. 9	12. 0	16. 24	·1435					
16. 12	10. 30	16. 28	·1433					

The indications are taken from the sheets of the Photographic Record, except where an asterisk is attached to the number, in which instances they are inferred from observations made with the telescope in the ancient manner. The Symbol *** denotes that the magnet has been generally in a state of agitation. The Symbol (†) denotes that the register has failed between the preceding and following readings. The Symbol : attached to a time denotes that the reading will apply equally well to a considerable range of time near that which is recorded. A brace denotes that at this time the curve of the Vertical Force was dislocated, and the difference of the numbers included by the brace shows the amount of the displacement.

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Nov. 19		Nov. 19						
h m	° ′ ″	h m		h m		h m	°	°
16. 19	20. 11. 15	16. 37	·1438					
16. 25	9. 30	16. 41	·1429					
16. 30	10. 30	16. 48	·1424					
16. 36	9. 50	16. 56	·1427					
16. 40	12. 0	17. 2	·1432					
16. 44	11. 0	17. 8	·1434					
16. 50	10. 55	17. 10	·1430					
16. 52	9. 45	17. 18	·1433					
16. 57	10. 35	17. 24	·1428					
17. 2	10. 0	17. 32	·1432					
17. 12	11. 55	17. 39	·1424					
17. 20	10. 45	18. 1	·1431					
17. 24	11. 30	18. 4	·1428					
17. 30	11. 0	18. 10	·1431					
17. 32	11. 20	18. 15	·1432					
17. 39	13. 0	18. 20	·1430					
17. 42	11. 10	18. 26	·1435					
17. 59	10. 20	18. 32	·1430					
18. 6	11. 30	18. 45	·1427					
18. 20	13. 15	18. 52	·1433					
18. 24	12. 10	18. 58	·1429					
18. 30	14. 0	19. 7	·1427					
18. 45	12. 45	19. 10	·1424					
18. 52	11. 40	19. 17	·1427					
18. 54	13. 30	19. 22	·1433					
18. 58	12. 30	19. 32	·1434					
19. 6	12. 55	19. 39	·1438					
19. 13	10. 10	19. 48	·1429					
19. 18	10. 55	19. 56	·1435					
19. 22	10. 0	20. 1	·1428					
19. 25	11. 10	20. 8	·1437					
19. 30	10. 0	20. 12	·1430					
19. 37	10. 20	20. 19	·1428					
19. 45	12. 30	20. 22	·1432					
19. 55	9. 0	20. 28	·1428					

Greenwich Mean Solar Time.	Western Declination.	Greenwich Mean Solar Time.	Horizontal Force in parts of the whole H. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Vertical Force in parts of the whole V. F. uncorrected for Temperature.	Greenwich Mean Solar Time.	Readings of Thermometers. Of H. F. Magnet.	Readings of Thermometers. Of V. F. Magnet.
Nov. 19		Nov. 19						
h m	° ′ ″	h m		h m		h m	°	°
19. 59	20. 10. 40	20. 32	·1433					
20. 2	8. 50	20. 43	·1426					
20. 12	9. 45	20. 58	·1427					
20. 18	7. 45	21. 10	·1423					
20. 26	9. 50	21. 30	·1422					
20. 38	10. 50	21. 45	·1417					
20. 42	8. 30	22. 2	·1421					
20. 48	10. 5	22. 22	·1422					
20. 55	8. 40	22. 33	·1416					
21. 0	9. 40		***					
21. 15	8. 0	22. 50	·1416					
21. 26	9. 30	22. 52	·1412					
21. 33	8. 30	22. 57	·1418					
21. 41	9. 20	23. 0	·1412					
21. 54	7. 5	23. 2	·1418					
21. 59	7. 50	23. 10	·1413					
22. 3	7. 0	23. 19	·1416					
	(†)	23. 28	·1414					
22. 20	9. 35	23. 41	·1418					
22. 28	9. 30	23. 52	·1426					
22. 36	10. 45	23. 59	·1419					
22. 40	11. 25							
22. 50	11. 10							
22. 57	10. 20							
23. 2	10. 30							
23. 6	8. 55							
23. 17	8. 45							
23. 22	10. 0							
23. 29	9. 25							
23. 36	10. 40							
23. 43	11. 15							
23. 45	12. 0							
23. 56	15. 30							
23. 59	14. 30							

For the Horizontal and Vertical Forces, increasing readings denote increasing forces.

ROYAL OBSERVATORY, GREENWICH.

RESULTS

OF

OBSERVATIONS

OF THE

MAGNETIC DIP.

1868.

RESULTS of OBSERVATIONS of MAGNETIC DIP, on each Day of Observation.

Day and Approximate Hour, 1868.	Needle.	Length of Needle.	Magnetic Dip.	Observer.
d h			° ′ ″	
January 7. 2	D 1	3 inches	67. 56. 38	N
15. 0	B 1	9 „	67. 58. 1	N
15. 2	C 1	6 „	67. 58. 6	N
25. 2	D 2	3 „	67. 59. 39	N
29. 2	B 2	9 „	67. 57. 19	N
31. 1	B 1	9 „	67. 53. 43	N
31. 2	D 2	3 „	68. 0. 10	N
February 6. 0	C 1	6 „	67. 56. 13	N
6. 2	D 1	3 „	67. 55. 6	N
13. 1	B 2	9 „	67. 54. 11	N
17. 2	D 2	3 „	67. 56. 58	N
20. 2	B 1	9 „	67. 54. 37	N
25. 0	C 1	6 „	67. 57. 11	N
25. 2	D 1	3 „	67. 57. 3	N
28. 1	C 1	6 „	67. 55. 46	N
28. 2	B 2	9 „	67. 55. 30	N
March 6. 2	C 2	6 „	67. 55. 17	N
10. 2	D 1	3 „	67. 58. 48	N
11. 23	D 1	3 „	67. 59. 47	N
12. 0	C 1	6 „	67. 56. 43	N
12. 1	B 1	9 „	67. 56. 40	N
21. 2	D 2	3 „	68. 0. 32	N
25. 1	D 2	3 „	67. 59. 11	N
27. 2	B 1	9 „	67. 55. 5	N
30. 2	C 2	6 „	67. 51. 58	N
31. 1	B 2	9 „	67. 54. 41	N
31. 2	D 1	3 „	68. 1. 0	N
April 4. 2	C 1	6 „	67. 58. 26	N
7. 2	B 1	9 „	67. 52. 29	N
9. 2	D 2	3 „	67. 59. 9	N
17. 2	B 2	9 „	67. 58. 50	N
21. 2	D 1	3 „	67. 54. 56	N
25. 1	B 1	9 „	67. 54. 30	N
30. 0	C 1	6 „	67. 56. 5	N
30. 1	C 2	6 „	67. 57. 9	N
30. 2	D 1	3 „	67. 59. 47	N
May 2. 2	C 1	6 „	67. 57. 48	N
4. 0	C 1	6 „	67. 57. 41	I
11. 1	C 2	6 „	67. 59. 32	N
13. 1	D 1	3 „	67. 55. 21	N
15. 0	B 1	9 „	67. 55. 11	N
15. 2	D 2	3 „	67. 59. 12	N
20. 1	C 1	6 „	67. 58. 57	N
20. 2	C 2	6 „	67. 59. 0	N
28. 1	B 2	9 „	67. 57. 4	N
June 9. 2	C 1	6 „	67. 56. 29	N
11. 1	C 2	6 „	67. 59. 42	N
12. 2	B 1	9 „	67. 54. 30	N
16. 1	D 1	3 „	67. 51. 35	N
[illegible]. 2	D 2	3 „	67. 59. 20	N
17. 22	D 1	3 „	68. 0. 22	N
18. 0	C 2	6 „	67. 53. 26	N
June 25. 0	B 2	9 inches	67. 52. 32	N
25. 23	C 1	6 „	67. 55. 53	N
26. 2	D 1	3 „	67. 59. 37	N
30. 2	D 2	3 „	67. 56. 49	N
July 6. 23	C 1	6 „	67. 58. 11	N
7. 1	C 2	6 „	67. 56. 39	N
11. 1	B 1	9 „	67. 56. 10	N
11. 2	D 1	3 „	67. 59. 5	N
16. 2	B 2	9 „	67. 53. 37	N
23. 2	B 1	9 „	67. 53. 52	N
23. 23	D 2	3 „	67. 57. 24	N
24. 0	C 1	6 „	67. 54. 7	N
30. 2	B 2	9 „	67. 53. 25	N
August 8. 0	Kew A1	3½ „	68. 0. 22	I
8. 2	C 1	6 „	67. 53. 5	N
8. 3	Kew A1	3½ „	67. 55. 19	N
10. 2	Kew A1	3½ „	67. 55. 24	I
10. 23	Kew A1	3½ „	68. 1. 29	I
11. 2	D 2	3 „	67. 53. 18	N
11. 3	Kew A1	3½ „	67. 56. 13	I
11. 22	Kew A1	3½ „	67. 55. 43	I
11. 23	Kew A2	3½ „	67. 59. 26	I
12. 3	Kew A2	3½ „	67. 55. 22	N
12. 22	Kew A1	3½ „	67. 57. 20	I
12. 23	Kew A2	3½ „	67. 59. 26	I
12. 23	Kew A1	3½ „	68. 2. 56	I
13. 1	Kew A1	3½ „	68. 0. 52	I
13. 2	Kew A1	3½ „	67. 55. 11	I
14. 0	Kew A1	3½ „	68. 2. 58	N
14. 1	C 2	6 „	67. 52. 59	N
14. 2	D 1	3 „	68. 1. 37	N
14. 22	Kew A1	3½ „	67. 57. 50	I
15. 0	Kew A2	3½ „	67. 59. 39	I
22. 2	C 1	6 „	67. 56. 17	N
24. 23	B 1	9 „	67. 54. 47	N
25. 2	B 2	9 „	67. 50. 18	N
25. 22	C 2	6 „	67. 58. 56	N
31. 0	D 1	3 „	67. 59. 42	N
31. 2	B 2	9 „	67. 53. 41	N
September 4. 0	C 1	6 „	67. 56. 37	N
10. 0	D 2	3 „	67. 58. 3	N
10. 1	D 1	3 „	67. 59. 23	N
10. 2	C 2	6 „	67. 55. 42	N
15. 2	C 1	6 „	67. 56. 31	N
23. 2	D 1	3 „	68. 0. 24	N
28. 22	C 2	6 „	67. 59. 12	N
29. 0	B 1	9 „	67. 56. 9	N
30. 1	B 2	9 „	67. 54. 27	N
October 7. 2	C 2	6 „	67. 56. 27	N
8. 0	B 1	9 „	67. 53. 37	N
8. 2	D 2	3 „	67. 56. 40	N
14. 2	C 1	6 „	67. 55. 43	N
23. 2	B 2	9 „	67. 50. 42	N

The initials N and I are those of Mr. W. C. Nash, and Lieut. Ielagin of the Russian Imperial Navy.

In the month of August several observations were made with a Kew dip-circle provided with two needles marked respectively A 1 and A 2, each 3½ inches in length.

From January 1 to March 3, Needle C 2 was in the hands of Mr. Simms, for the purpose of having a new axle applied.

RESULTS of OBSERVATIONS of MAGNETIC DIP, on each Day of Observation—*continued.*

Day and Approximate Hour, 1868.	Needle.	Length of Needle.	Magnetic Dip.	Observer.	Day and Approximate Hour, 1868.	Needle.	Length of Needle.	Magnetic Dip.	Observer.
d h			° ′ ″		d h			° ′ ″	
October 26. 2	D 1	3 inches	67. 52. 49	N	November 25. 0	B 1	9 inches	67. 55. 1	N
26. 23	B 1	9 „	67. 56. 34	N	25. 2	B 2	9 „	67. 57. 47	N
30. 1	B 2	9 „	67. 45. 51	N	30. 3	D 2	3 „	67. 58. 9	N
30. 2	D 1	3 „	67. 56. 50	N					
					December 7. 2	D 1	3 „	67. 56. 54	N
November 6. 2	C 2	6 „	67. 54. 57	N	12. 2	C 1	6 „	67. 52. 50	N
7. 2	C 1	6 „	67. 57. 5	N	17. 2	C 2	6 „	68. 0. 28	N
13. 2	D 1	3 „	67. 56. 50	N	18. 1	D 2	3 „	67. 56. 43	N
23. 2	D 2	3 „	68. 0. 27	N	24. 7	B 1	9 „	67. 52. 15	N
24. 1	C 1	6 „	68. 0. 16	N	26. 2	C 2	6 „	67. 55. 15	N

The initials N and I are those of Mr. W. C. Nash, and Lieut. Ielagin of the Russian Imperial Navy.

MONTHLY MEANS of MAGNETIC DIPS.

Month, 1868.	B 1, 9-inch Needle.	Number of Observations.	B 2, 9-inch Needle.	Number of Observations.	C 1, 6-inch Needle.	Number of Observations.	C 2, 6-inch Needle.	Number of Observations.
	° ′ ″		° ′ ″		° ′ ″		° ′ ″	
January	67. 55. 52	2	67. 57. 19	1	67. 58. 6	1	..	..
February	67. 54. 37	1	67. 54. 50	2	67. 56. 23	3	..	..
March	67. 55. 53	2	67. 54. 41	1	67. 56. 43	1	67. 53. 38	2
April	67. 53. 29	2	67. 58. 50	1	67. 57. 15	2	67. 57. 9	1
May	67. 55. 11	1	67. 57. 4	1	67. 58. 9	3	67. 59. 16	2
June	67. 54. 30	1	67. 52. 32	1	67. 56. 11	2	67. 56. 34	2
July	67. 55. 1	2	67. 53. 31	2	67. 56. 9	2	67. 56. 39	1
August	67. 54. 47	1	67. 51. 59	2	67. 54. 41	2	67. 55. 58	2
September	67. 56. 9	1	67. 54. 27	1	67. 56. 34	2	67. 57. 27	2
October	67. 55. 6	2	(67. 48. 17)	(2)	67. 55. 43	1	67. 56. 27	1
November	67. 55. 1	1	67. 57. 47	1	67. 58. 41	2	67. 54. 57	1
December	67. 52. 15	1	..	..	67. 52. 50	1	67. 57. 52	2
Means	67. 54. 54	Sum 17	67. 54. 52	Sum 13	67. 56. 38	Sum 22	67. 56. 40	Sum 16

Month, 1868.	D 1, 3-inch Needle.	Number of Observations.	D 2, 3-inch Needle.	Number of Observations.	Kew A 1, 3½-inch Needle.	Number of Observations.	Kew A 2, 3½-inch Needle.	Number of Observations.
	° ′ ″		° ′ ″		° ′ ″		° ′ ″	
January	67. 56. 38	1	67. 59. 55	2	..	..	..	..
February	67. 56. 5	2	67. 56. 58	1	..	..	..	..
March	67. 59. 52	3	67. 59. 52	2	..	..	..	..
April	67. 57. 22	2	67. 59. 9	1	..	..	..	..
May	67. 55. 21	1	67. 59. 12	1	..	..	..	..
June	67. 57. 11	3	67. 58. 5	2	..	..	..	..
July	67. 59. 5	1	67. 57. 24	1	..	..	..	..
August	68. 0. 39	2	67. 53. 18	1	67. 58. 28	12	67. 58. 28	4
September	67. 59. 54	2	67. 58. 3	1	..	..	..	..
October	67. 54. 50	2	67. 56. 40	1	..	..	..	..
November	67. 56. 50	1	67. 59. 18	2	..	..	..	..
December	67. 56. 54	1	67. 56. 43	1	..	..	..	..
Means	67. 57. 47	Sum 21	67. 58. 14	Sum 16	..	..	..	..

For this table the monthly means have been formed without reference to the hour at which the observation was made on each day, as in preceding years no certain difference was found between observations taken at 21^h and at 3^h.

In combining the monthly results, to form the annual means, weights have been given proportional to the number of observations.

YEARLY MEANS of MAGNETIC DIPS for each of the NEEDLES, and GENERAL MEAN for the Year 1868.

Lengths of the several Sets of Needles.	Needles.	Number of Observations with each Needle.	Mean Yearly Dip from Observations with each Needle.	Mean Yearly Dip from each Set of Needles.	Mean Yearly Dip from all the Sets of Needles.
			° ′ ″	° ′ ″	° ′ ″
9-inch Needles	B 1	17	67. 54. 54	67. 54. 53	
	B 2	13	67. 54. 52		
6-inch Needles	C 1	22	67. 56. 38	67. 56. 39	67. 56. 31
	C 2	16	67. 56. 40		
3-inch Needles	D 1	21	67. 57. 47	67. 58. 0	
	D 2	16	67. 58. 14		

ROYAL OBSERVATORY, GREENWICH.

OBSERVATIONS

OF

DEFLEXION OF A MAGNET

FOR

ABSOLUTE MEASURE

OF

HORIZONTAL FORCE.

1868.

ABSTRACT of the OBSERVATIONS of DEFLEXION of a MAGNET for ABSOLUTE MEASURE of HORIZONTAL FORCE.

Month and Day, 1868.	Distances of Centers of Magnets.	Temperature.	Observed Deflexion.	Mean of the Times of Vibration of Deflecting Magnet.	Number of Vibrations.	Temperature.	Observer.
	ft.	°	° ′ ″	s		°	
January 23	1·0 1·3	39·0	12. 22. 0 5. 36. 5	5·350 5·342	100 100	44·0 42·5	N
February 18	1·0 1·3	45·5	12. 21. 28 5. 35. 52	5·357 5·350	100 100	45·8 47·6	N
March 6	1·0 1·3	50·8	12. 21. 15 5. 35. 42	5·354 5·358	100 100	52·7 53·6	N
April 14	1·0 1·3	57·2	12. 20. 2 5. 35. 10	5·366 5·372	100 100	58·2 63·4	N
April 23	1·0 1·3	61·1	12. 18. 55 5. 34. 39	5·364 5·359	100 100	64·3 63·8	N
May 19	1·0 1·3	82·2	12. 14. 9 5. 32. 45	5·368 5·372	100 100	84·6 83·7	N
June 29	1·0 1·3	75·1	12. 12. 36 5. 31. 55	5·373 5·387	100 100	78·8 77·6	N
July 28	1·0 1·3	85·5	12. 11. 22 5. 31. 16	5·390 5·383	100 100	89·0 86·6	N
August 26	1·0 1·3	67·9	12. 10. 22 5. 30. 50	5·380 5·385	100 100	69·4 68·0	N
September 25	1·0 1·3	61·1	12. 10. 44 5. 31. 5	5·390 5·390	100 100	61·0 62·0	N
October 27	1·0 1·3	51·5	12. 10. 47 5. 31. 9	5·396 5·396	100 100	57·4 55·7	N
November 26	1·0 1·3	48·9	12. 12. 10 5. 31. 32	5·394 5·394	100 100	52·0 54·0	N
December 23	1·0 1·3	47·5	12. 11. 12 5. 31. 0	5·395 5·393	100 100	51·1 50·4	N

The position of the Deflecting Magnet with regard to the suspended Magnet is always that which was formerly termed "Lateral." The Deflecting Magnet is placed on the East side of the suspended Magnet, with its marked pole alternately E. and W., and it is placed on the West side with its pole alternately E. and W.; and the deflexion in the table above is the mean of the four deflexions in those positions of the magnets.

The lengths of 1 foot and 1·3 foot answer to 304·8 and 396·2 millimètres respectively.

The initial N is that of Mr. W. C. Nash.

In the following calculations every observation is reduced to the temperature 35°.

COMPUTATION of the VALUES of ABSOLUTE MEASURE of HORIZONTAL FORCE in the Year 1868.

Month and Day, 1868.		In English Measure.									Value of X in French Measure.
		Apparent Value of A^1	Apparent Value of A^2.	Apparent Value of P.	Mean Value of P.	Log. A corrected by the Application of Mean Value of P. = Log. $\frac{m}{X}$	Adopted Time of Vibration of Deflecting Magnet.	Log. m X.	Value of X.	Value of m.	
							s				
January	23	+0·10714	0·10727	−0·00298	−0·00283	9·03119	5·3460	0·20378	3·857	0·4145	1·779
February	18	+0·10718	0·10732	−0·00321		9·03137	5·3535	0·20302	3·853	0·4142	1·777
March	6	+0·10725	0·10736	−0·00252		9·03159	5·3560	0·20307	3·853	0·4143	1·776
April	14	+0·10719	0·10731	−0·00274		9·03137	5·3690	0·20146	3·846	0·4135	1·774
	23	+0·10710	0·10722	−0·00275		9·03101	5·3615	0·20292	3·854	0·4140	1·777
May	19	+0·10682	0·10701	−0·00437		9·03003	5·3700	0·20299	3·859	0·4135	1·779
June	29	+0·10646	0·10661	−0·00346		9·02847	5·3800	0·20091	3·857	0·4118	1·778
July	28	+0·10649	0·10660	−0·00253		9·02852	5·3865	0·20056	3·855	0·4117	1·778
August	26	+0·10601	0·10612	−0·00255		9·02654	5·3825	0·19982	3·860	0·4104	1·780
September	25	+0·10594	0·10608	−0·00324		9·02630	5·3900	0·19813	3·854	0·4095	1·777
October	27	+0·10577	0·10592	−0·00348		9·02565	5·3960	0·19681	3·851	0·4085	1·776
November	26	+0·10592	0·10600	−0·00185		9·02612	5·3940	0·19691	3·849	0·4088	1·775
December	23	+0·10575	0·10580	−0·00116		9·02538	5·3940	0·19675	3·852	0·4084	1·776
Means........		..	..	..	..	..	..	..	3·854	..	1·777

ROYAL OBSERVATORY, GREENWICH.

RESULTS

OF

METEOROLOGICAL OBSERVATIONS.

1868.

MONTH and DAY, 1868.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	Osler's. General Direction. P.M.	Osler's. Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
Jan. 1	..	30·002	31·2	25·5	28·9	19·8	32·5	20·0	..	..	9·1	13·0	3·9	− 8·4	Calm : N	NNE : NE	2·2	0·0	0·1	219	0·00
2	In Equator.	30·054	34·4	27·9	29·8	20·8	44·0	25·9	..	..	9·0	12·2	1·3	− 7·2	NE : NNE	NNE : NE : E	2·0	0·0	0·4	294	0·03
3	First Qr.	29·992	30·0	22·8	27·1	19·7	40·0	15·0	..	..	7·4	10·6	4·7	− 9·6	NNE	N : NNE	3·0	0·0	0·6	360	0·00
4	..	29·843	31·8	26·7	27·9	24·0	32·1	26·1	..	..	3·9	4·6	2·3	− 8·5	NE	Calm	2·5	0·0	0·3	215	0·02
5	..	29·828	32·7	26·8	30·8	30·8	33·8	25·0	..	..	0·0	0·3	0·0	− 5·4	Calm : NE	NE : NNE	3·8	0·0	0·3	251	0·13
6	..	29·736	35·9	29·2	32·1	30·6	36·5	28·2	..	..	1·5	2·1	0·9	− 3·9	NNE	NNE : ESE	0·7	0·0	0·1	264	0·10
7	..	29·884	32·7	25·0	28·7	25·3	47·8	20·0	35·4	33·4	3·4	6·7	1·3	− 7·1	Calm	N	0·5	0·0	0·0	153	0·08
8	..	29·956	34·0	30·7	31·5	29·3	34·0	30·7	34·4	32·4	2·2	2·6	0·0	− 4·2	NNE : NE	NE	1·2	0·0	0·1	271	0·18
9	Greatest Dec. N. Full.	30·078	31·2	29·2	29·7	28·1	34·0	28·9	34·4	33·4	1·6	2·8	0·4	− 6·1	NE	NNE : Calm	0·0	0·0	0·0	139	0·04
10	Perigee	30·061	32·8	28·7	30·3	26·9	38·7	25·0	34·5	33·9	3·4	4·2	2·3	− 5·6	Calm	SE : Calm	0·0	0·0	0·0	114	0·00
11	..	29·728	32·7	28·9	31·0	28·0	34·7	27·0	34·4	32·4	3·0	5·5	0·7	− 5·0	SSE	SSE	1·1	0·0	0·1	173	0·29
12	..	29·763	43·5	33·9	38·4	38·1	47·8	33·0	34·4	33·9	0·3	0·9	0·0	+ 2·3	WSW : SW	SW	3·9	0·0	0·3	318	0·06
13	..	29·386	49·1	41·8	45·2	39·3	65·6	38·8	37·4	35·4	5·9	10·3	0·4	+ 9·0	SSW : S : WSW	SW : W	25·8	0·1	2·2	577	0·13
14	..	29·566	51·9	38·1	46·9	45·8	51·9	31·0	37·4	35·4	1·1	4·2	0·0	+ 10·6	SW : SSW	SW	15·1	0·0	1·5	509	0·03
15	In Equator.	29·811	51·4	39·2	44·9	38·9	76·0	35·5	38·4	36·4	6·0	10·7	2·8	+ 8·5	WSW : SW	W : WSW	8·6	0·0	1·3	483	0·13
16	Last Qr.	30·015	49·7	38·1	44·8	43·8	53·0	33·1	39·4	37·4	1·0	3·4	0·4	+ 8·3	WSW : SW	SSW : SW	17·2	0·0	1·4	457	0·00
17	..	29·654	51·9	43·7	48·5	46·9	55·0	42·6	41·4	39·4	1·6	3·8	0·0	+ 11·9	SSW	SW	20·0	1·1	3·8	668	0·11
18	..	29·134	49·7	40·7	45·5	42·6	49·7	38·5	43·4	42·4	2·9	4·2	2·3	+ 8·8	SW	SW	30·0	0·1	4·5	656	0·34
19	..	28·915	47·7	38·8	43·6	37·4	60·3	36·0	43·4	41·4	6·2	9·0	2·1	+ 6·7	WSW	WSW : W	27·2	0·0	2·4	631	0·36
20	..	29·071	42·4	29·5	36·7	32·8	47·0	24·0	43·4	41·4	3·9	8·1	1·1	− 0·3	SW : NE	NE : N	2·1	0·0	0·2	234	0·00
21	..	29·476	41·1	29·5	36·7	35·0	48·7	23·0	43·5	41·7	1·7	6·7	0·0	− 0·5	Calm : SSW	SW : SSE	2·0	0·0	0·1	217	0·08
22	Greatest Declination S.	28·946	42·9	35·6	37·3	35·4	42·9	32·5	42·4	40·9	1·9	2·9	0·0	− 0·1	SSE : SW : NNE	NNE : NNW	2·7	0·0	0·2	244	1·21
23	Apogee	29·725	36·6	32·0	33·7	27·0	44·0	27·8	40·4	38·4	6·7	8·6	4·1	− 4·0	NNW : N : N by E	NNE : N by E	1·7	0·0	0·3	309	0·00
24	New	30·003	38·1	26·3	33·0	26·0	51·0	20·0	38·4	36·4	7·0	11·8	2·4	− 4·9	N by E	S by W : SSW	30·0	0·0	1·0	327	0·06
25	..	29·492	47·4	34·1	40·9	36·2	71·6	33·1	37·4	35·4	4·7	8·4	0·3	+ 2·8	SW	WNW : W	30·0	0·0	2·3	493	0·32
26	..	30·017	43·1	29·8	37·5	29·9	62·5	25·0	37·4	35·4	7·6	11·0	4·3	− 0·8	NW : N	N	2·2	0·0	0·2	263	0·00
27	..	30·053	45·2	29·8	37·8	37·0	45·2	24·0	36·9	35·4	0·8	5·3	0·0	− 0·6	WSW : SW	SSW : W by S	2·1	0·0	0·2	279	0·43
28	..	29·846	49·7	44·1	46·7	45·8	53·0	42·2	37·4	35·9	0·9	1·7	0·0	+ 8·3	SW : WSW	W : NNW	2·4	0·0	0·1	275	0·06
29	In Equator.	30·145	44·2	34·4	38·9	31·5	60·5	30·0	38·4	36·4	7·4	12·1	3·8	+ 0·6	NW : W	WNW : W	4·3	0·0	0·5	415	0·00
30	..	30·054	47·3	34·6	41·9	37·9	74·0	30·6	39·4	37·4	4·0	7·8	0·0	+ 3·8	WSW	SW	20·0	0·0	1·2	479	0·00
31	..	29·736	51·4	42·7	47·8	43·8	71·2	41·3	40·4	39·4	4·0	7·2	0·0	+ 9·9	SW	SW	26·5	0·5	4·8	720	0·00
Means	..	29·741	41·4	32·8	37·2	33·4	49·6	29·5	38·5	36·9	3·9	6·5	1·3	+ 0·3	...	...	..	..	..	Sum 11007	Sum 4·19

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was $30^{in}\cdot090$ on the 2nd; the first minimum in the month was $29^{in}\cdot986$ on the 1st.
The second maximum ,, was $29^{in}\cdot911$ on the 7th; the second minimum ,, was $29^{in}\cdot707$ on the 6th.
The third maximum ,, was $30^{in}\cdot096$ on the 10th; the third minimum ,, was $29^{in}\cdot847$ on the 7th.
The fourth maximum ,, was $29^{in}\cdot834$ on the 12th; the fourth minimum ,, was $29^{in}\cdot691$ on the 11th.
The fifth maximum ,, was $29^{in}\cdot638$ on the 14th; the fifth minimum ,, was $29^{in}\cdot316$ on the 13th.
The sixth maximum ,, was $30^{in}\cdot119$ on the 16th; the sixth minimum ,, was $29^{in}\cdot500$ on the 14th.
The seventh maximum ,, was $28^{in}\cdot947$ on the 19th; the absolute minimum ,, was $28^{in}\cdot866$ on the 18th.
The eighth maximum ,, was $29^{in}\cdot550$ on the 21st; the eighth minimum ,, was $28^{in}\cdot895$ on the 20th.
The ninth maximum ,, was $30^{in}\cdot172$ on the 24th; the ninth minimum ,, was $28^{in}\cdot883$ on the 22nd.
The tenth maximum ,, was $30^{in}\cdot164$ on the 27th; the tenth minimum ,, was $29^{in}\cdot452$ on the 25th.
The absolute maximum ,, was $30^{in}\cdot220$ on the 29th; the eleventh minimum ,, was $29^{in}\cdot812$ on the 28th.
The range in the month was $1^{in}\cdot354$.
The mean for the month was $29^{in}\cdot741$, being $0^{in}\cdot005$ *lower* than the average of the preceding 27 years.

TEMPERATURE OF THE AIR.

The highest in the month was $51^{\circ}\cdot9$ on the 14th and 17th; the lowest was $22^{\circ}\cdot8$ on the 3rd.
The range ,, was $29^{\circ}\cdot1$.
The mean ,, of all the highest daily readings was $41^{\circ}\cdot4$, being $1^{\circ}\cdot7$ *lower* than the average of the preceding 27 years.
The mean ,, of all the lowest daily readings was $32^{\circ}\cdot8$, being $0^{\circ}\cdot6$ *lower* than the average of the preceding 27 years.
The mean daily range was $8^{\circ}\cdot6$, being $1^{\circ}\cdot2$ *less* than the average of the preceding 27 years.
The mean for the month was $37^{\circ}\cdot2$, being $0^{\circ}\cdot9$ *lower* than the average of the preceding 27 years.

MONTH and DAY, 1868.	ELECTRICITY. A.M.	ELECTRICITY. P.M.	CLOUDS AND WEATHER. A.M.	CLOUDS AND WEATHER. P.M.
Jan. 1	w	m : m	10, ci.-s, cu.-s, h	9, ci, ci.-s, ci.-cu, cu.-s, sl.-sn : 10, sl.-sn
2	w	w : o	10, li.-cl	10, sn : 10, sl.-sn : o
3	w : w	w : sP : o	o : 10, sl.-sn	8, ci, ci.-cu, ci.-s, sl.-sn : 7, ci.-s, sc, oc.-sn : 10, oc.-sn
4	o : w		10, sn : 10, oc.-sn	10, oc.-sn : 10, oc.-sn
5			10, m.-r	10, sl.-sn, m.-r, sl
6			10, oc.-sn	10, sn : 10
7			fr, h : 2, ci, h	2, ci, h : 10, sn : 10, sn
8			10, sn : 10	10, th.-r : 10, th.-r
9			10	10, m.-r : 10, sn
10			10, ci, ci.-s	10 : 10, th.-cl
11			10 : 10, ci.-s, cu.-s, sl, r	10, r : 10, r
12			10, th.-r	10, oc.-r : 10, ci.-cu, cu.-s, sc, w
13			10, w : 10, r, st.-w	vv, ci, ci.-s, ci.-cu, cu.-s, st.-w : 10, h.-r, st.-w : vv
14			ci, ci.-s : 10, r	10, r, st.-w : 10, sc, oc.-r, st.-w
15			10, h.-r : o : v, ci.-cu, cu	v, ci, ci.-cu, ci.-s, w : s : o
16			10 : 10, sc, w	10, sc, sl.-r, w : 10, sc, oc.-r, st.-w
17			10, g : 10, sc, m.-r, st.-w	10, sc, r, g : vv, f.-h.-sqs
18			10, sc, w : 10, sc, f.-h.-sqs, r	10, h.-g, r : 10, r, st.-w : 10, r, w
19			10, h.-r, hl, w : 10, w : vv, ci, ci.-s, sc, st.-w, shs.-r	ci.-s, c.-r : v
20			10	v, ci, ci.-cu, cu.-s : o, h.-fr
21			10, ci.-s, ci.-cu : 10, sc, oc.-r	10, r : 10, th.-cl, h.-r
22			10, c.-h.-r : 10, c.-h.-r	10, ci.-cu, h.-r : v : 10, r
23			10, ci, ci.-s, cu.-s, h.-fr : 10, ci.-s	10, ci.-s, sl : v, ci, ci.-s
24			o, h.-fr : v	v, ci, ci.-s : 10, st.-w : 10, h.-r, h.-g
25			10, h.-g, h.-r : 2, ci	10, li.-cl : v, h.-d
26			9, ci.-s, cu.-s, ci.-cu, h	v, ci, h : o, sl.-f, h.-fr, h
27			10, li.-cl : 10, r	10, h.-r : 5, li.-cl
28			10	10, r : 10
29			v, ci.-cu, h.-fr	5, ci.-cu, cu.-s, ci.-s : 5, th.-cl
30			9, li.-cl : 10, ci.-s	10, st.-w : vv, st.-w, sl.-r
31			9, ci, ci.-cu, ci.-s, li.-sc, st.-w	10, sc, h.-g : 10, sc, h.-g, r

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was $49^{\circ}\cdot2$ on the 17th; and the lowest was $16^{\circ}\cdot2$ on the 2nd.

The mean ,, was $33^{\circ}\cdot4$, being $1^{\circ}\cdot5$ *lower* than the average of the preceding 27 years.

Elastic Force of Vapour.—The mean for the month was $0^{in}\cdot191$, being $0^{in}\cdot011$ *less* than the average of the preceding 27 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was $2^{grs}\cdot2$, being $0^{gr}\cdot2$ *less* the average of the preceding 27 years.

Degree of Humidity.—The mean for the month was 86 (that of Saturation being represented by 100), being 2 *less* than the average of the preceding 27 years.

Weight of a Cubic Foot of Air.—The mean for the month was 555 grains, being 1 grain *greater* than the average of the preceding 27 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 8·4.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 1·0.

WIND.

The proportions were of N. 7, S. 7, W. 10, E. 4, and Calm 3. The greatest pressure in the month was $30^{lbs}\cdot0$ on the square foot on the 18th, 24th, and 25th.

RAIN.

Fell on 21 days in the month, amounting to $4^{in}\cdot19$, as measured in the simple cylinder gauge partly sunk below the ground; being $2^{in}\cdot38$ *greater* than the average fall of the preceding 53 years.

ELECTRICITY.—The insulating lamp was not burning from January 5 to 31.

MONTH and DAY, 1868.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water … Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference … Greatest.	Difference … Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	General Direction. P.M.	Pressure in lbs. on the square foot. Greatest.	Pressure Least.	Pressure Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
Feb. 1	First Qr.	29·254	55·0	43·0	48·0	41·1	75·0	38·2	40·9	39·7	6·9	14·0	3·2	+10·2	SW	W by S	35·0	0·6	9·0	..	0·02
2	..	29·735	49·7	38·9	43·3	37·0	83·0	33·5	40·9	39·4	6·3	13·4	1·1	+ 5·6	WSW	WSW : S : SW	27·0	0·0	1·2	..	0·25
3	..	29·824	50·9	34·0	40·4	30·2	78·6	29·7	41·4	39·9	10·2	15·4	6·2	+ 2·6	WSW : W	WNW : W	26·0	0·1	1·6	..	0·00
4	..	30·219	47·9	31·1	40·3	34·5	84·2	26·0	43·4	41·4	5·8	11·5	0·0	+ 2·3	W : WSW	WSW	15·6	0·0	1·4	..	0·00
5	Greatest Declination N.	30·114	48·2	39·7	44·3	35·9	64·0	34·5	42·4	41·4	8·4	11·1	5·1	+ 6·0	SW	WSW	30·0	0·1	2·3	..	0·00
6	..	30·146	49·8	34·6	40·9	34·2	87·0	30·5	41·5	40·9	6·7	14·1	1·2	+ 2·3	WSW	W : SW	5·2	0·0	0·3	..	0·00
7	Perigee	29·769	46·8	34·1	41·1	38·2	78·5	29·2	42·4	41·4	2·9	9·7	0·7	+ 2·3	S : SSW	SW : SSW	7·6	0·0	0·5	..	0·02
8	Full	29·754	45·8	32·0	38·0	33·2	47·0	29·0	42·4	40·9	4·8	8·3	2·6	− 0·9	SSW : W : NW	NNE : N	4·1	0·0	0·8	..	0·09
9	..	30·390	41·4	26·7	34·5	29·2	69·2	23·9	39·4	38·4	5·3	8·9	3·7	− 4·4	NNW : WSW	WSW : SW	2·0	0·0	0·1	..	0·00
10	..	30·358	51·9	37·1	44·5	41·1	76·8	32·8	40·9	39·4	3·4	7·4	0·0	+ 5·7	SW	WSW	3·9	0·0	0·8	..	0·00
11	In Equator.	30·339	49·7	37·8	43·5	37·6	59·0	35·7	41·4	40·4	5·9	12·8	0·0	+ 4·9	WSW	NW	2·5	0·0	0·3	..	0·00
12	..	30·305	43·6	30·7	37·0	33·5	45·0	29·5	41·9	40·9	3·5	7·7	0·0	− 1·4	WSW	NW : W	0·2	0·0	0·0	170	0·00
13	..	30·125	50·0	33·7	42·4	38·9	85·0	28·5	41·9	41·4	3·5	8·6	0·0	+ 4·1	WSW	W : WSW	1·0	0·0	0·1	243	0·00
14	..	29·979	47·7	41·1	44·0	37·9	57·6	38·5	41·4	39·4	6·1	8·8	2·0	+ 5·8	WSW	WSW : SW	2·7	0·0	0·4	369	0·00
15	Last Qr.	30·006	45·7	33·8	40·5	37·2	49·0	28·8	42·0	40·0	3·3	9·0	0·4	+ 2·4	SW	NNW	2·6	0·0	0·3	356	0·04
16	..	30·354	47·2	29·4	38·2	31·2	88·0	24·1	42·4	40·9	7·0	14·9	0·0	+ 0·1	WSW : SW	WSW : SSW	1·5	0·0	0·1	276	0·00
17	..	30·159	51·3	33·2	41·3	33·4	103·0	26·6	42·7	41·3	7·9	18·0	0·0	+ 3·1	SSW	SW : SSW	1·5	0·0	0·1	307	0·00
18	Greatest Declination S.	29·955	47·9	35·5	42·0	41·6	56·0	31·2	42·9	41·4	0·4	2·4	0·0	+ 3·7	SW : SSW	S by W	2·0	0·0	0·1	254	0·01
19	..	29·492	45·9	40·0	42·9	39·8	49·0	38·0	41·4	39·4	3·1	4·4	1·8	+ 4·4	S	NNW	22·5	0·0	1·6	447	0·04
20	Apogee	29·937	49·7	32·2	40·5	33·7	91·0	28·6	42·4	41·4	6·8	14·9	0·0	+ 1·8	NW : SW	SW	15·0	0·0	1·1	405	0·08
21	..	29·809	55·2	41·4	47·7	40·9	80·7	41·1	42·5	41·7	6·8	13·0	2·5	+ 8·9	SW : WSW	WNW : SW	13·0	0·0	0·6	326	0·01
22	..	29·612	52·2	39·6	44·3	36·9	73·0	35·2	43·4	42·4	7·4	15·3	2·5	+ 5·3	SW	WNW : WSW	22·5	0·0	1·0	494	0·02
23	New	30·121	43·1	35·7	39·1	28·0	79·0	29·9	42·5	41·7	11·1	14·3	9·3	− 0·1	NNW	NbyW:NW:WSW	26·0	0·0	2·1	414	0·00
24	..	30·068	56·2	38·9	48·0	46·0	83·0	35·0	41·4	40·4	2·0	6·1	0·0	+ 8·6	WSW	WSW	2·5	0·0	0·4	404	0·00
25	..	30·182	61·7	43·4	51·4	45·2	88·7	37·0	40·9	39·5	6·2	14·1	0·8	+11·8	WSW	WNW : WSW	2·9	0·0	0·5	401	0·00
26	In Equator.	30·126	55·9	42·1	48·5	42·2	83·4	35·1	41·4	40·9	6·3	10·2	3·1	+ 8·7	WSW	WSW	2·4	0·0	0·5	370	0·00
27	..	29·899	49·7	44·4	46·5	42·0	56·1	42·0	42·4	41·4	4·5	7·8	2·7	+ 6·6	WSW	WSW : SW	1·5	0·0	0·2	333	0·00
28	..	29·749	56·2	41·3	48·7	41·5	100·0	37·5	44·4	42·4	7·2	13·2	3·1	+ 8·6	SW : SSW	SSW	2·2	0·0	0·2	351	0·00
29	..	29·352	51·0	41·9	45·9	41·0	66·0	38·3	44·9	42·9	4·9	8·8	0·2	+ 5·8	SSW	SSW : W	30·0	0·0	2·6	572	0·70
Means	..	29·970	49·9	36·8	43·0	37·3	73·6	32·7	42·1	40·8	5·7	11·0	1·8	+ 4·3	...	...	..	..	..	Sum (18days) 6492	Sum 1·28

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was $29^{in}\cdot815$ on the 2nd; the first minimum in the month was $29^{in}\cdot138$ on the 1st.
The second maximum ,, was $30^{in}\cdot247$ on the 4th; the second minimum ,, was $29^{in}\cdot632$ on the 2nd.
The third maximum ,, was $30^{in}\cdot177$ on the 6th; the third minimum ,, was $30^{in}\cdot045$ on the 5th.
The absolute maximum ,, was $30^{in}\cdot404$ on the 9th; the fourth minimum ,, was $29^{in}\cdot557$ on the 8th.
The fifth maximum ,, was $30^{in}\cdot396$ on the 16th; the fifth minimum ,, was $29^{in}\cdot917$ on the 15th.
The sixth maximum ,, was $30^{in}\cdot022$ on the 20th; the sixth minimum ,, was $29^{in}\cdot380$ on the 19th.
The seventh maximum ,, was $29^{in}\cdot833$ on the 21st; the seventh minimum ,, was $29^{in}\cdot778$ on the 21st.
The eighth maximum ,, was $30^{in}\cdot186$ on the 23rd; the eighth minimum ,, was $29^{in}\cdot611$ on the 22nd.
The ninth maximum ,, was $30^{in}\cdot225$ on the 25th; the ninth minimum ,, was $30^{in}\cdot059$ on the 24th.
the absolute minimum ,, was $29^{in}\cdot116$ on the 29th.
The range in the month was $1^{in}\cdot288$.
The mean for the month was $29^{in}\cdot970$, being $0^{in}\cdot177$ *higher* than the average of the preceding 27 years.

TEMPERATURE OF THE AIR.

The highest in the month was 61°·7 on the 25th; the lowest was 26°·7 on the 9th.
The range ,, was 35°·0.
The mean ,, of all the highest daily readings was 49°·9, being 4°·8 *higher* than the average of the preceding 27 years.
The mean ,, of all the lowest daily readings was 36°·8, being 3°·1 *higher* than the average of the preceding 27 years.
The mean daily range was 13°·1, being 1°·7 *greater* than the average of the preceding 27 years.
The mean for the month was 43°·0, being 4°·1 *higher* than the average of the preceding 27 years.

ROBINSON'S ANEMOMETER. Under repair from February 1 to 11.

MONTH and DAY, 1868.	ELECTRICITY. A.M.	ELECTRICITY. P.M.	CLOUDS AND WEATHER. A.M.	CLOUDS AND WEATHER. P.M.
Feb. 1			10, h.-g, sl.-r : 10, g, sc, h.-r	ci, ci.-cu, ci.-s, h.-g : 0, st.-w
2			0 : v	v, ci, ci.-cu, ci.-s : 10, h.-r, st.-w
3			1, s, w : li.-cl	4, ci.-cu, ci, oc.-r, w : 0
4			1, ci, h.-fr : 2, ci, ci.-cu	5, ci, ci.-cu : vv, sl.-r, lu.-co : 1, ci, lu.-ha
5			10	10, ci.-s, cu.-s, ci, ci.-cu, st.-w : vv, ci.-s, st.-w : 10, th.-cl, w
6			3, li.-cl	v, ci. ci.-cu : 0
7			10 : 10, th.-r	9, ci.-cu, ci.-s, cu.-s : 10, sc, oc.-r
8			10, r, glm : 10	10, glm, r, w : 4, ci, ci.-cu, ci.-s, w, sl.-r : v, ci.-cu, cu.-s
9			0, h, h.-fr : 1, ci	li.-cl, ci.-cu
10			10 : 10, ci.-s, cu.-s	2, ci, ci.-cu : v
11			4, ci, ci.-s : v, ci.-cu, ci.-s, th.-r	v, cu.-s, ci.-cu, ci.-s : 0
12			0, h.-fr, h, sl.-f : 8, li.-cl, h	8, ci, ci.-cu, ci.-s : 10, sl.-f : 10, ci, ci.-s
13	0	w : 0	8, th.-cl : 9, li.-cl	4, ci.-cu : 10, li.-cl
14	w : w	0	7, ci, ci.-cu, cu.-s	10, ci.-s, ci.-cu, h : 10
15	0	0	10, sc, th.-r	10, sc, r : v, li.-cl : 0
16	0	0 : w	0 h.-fr : 1, ci	0, h.-fr
17	0	0	2, ci, h.-fr : 0	5, ci, ci.-cu, ci.-s: v, s : 0
18			10	10, sc, oc.-r : 10, ci.-s, glm
19			10, w : 10, sc, th.-r	10, sc, r, st.-w : 10 sc, th.-r, st.-w
20			0, sl.-f, h, glm : ci, ci.-s, h	ci, ci.-cu, ci-.s: 10, ci.-s : 10, r, w
21			10, sl.-f, ci.-cu, ci.-s, r : 10, ci.-cu, ci.-s, cu.-s	v, ci.-cu, ci.-s, cu.-s : 10
22	0	0	10, glm, sc, th.-r : 10, h.-r, sq	v, ci.-cu, w : s, oc.-r, w: 5, ci.-cu, cu.-s, sl.-r, st.-w
23	w : 0	0	0 : v, g	5, ci.-cu, cu.-s : v, th.-cl
24	0	0	10 : v, li.-cl	9, ci.-s, ci : 3, li.-cl, ci : 0, w
25	0	0 : w	8, ci.-cu, ci.-s, d, f : 3, ci, ci.-cu, ci.-s, h	2, li.-cl, ci.-cu, cu.-s : 0
26	0 : sP	w : w	10, ci.-s	v, ci.-cu : 8, li.-cl
27	0	0	10, th.-r : 10, th.-r	10, ci.-cu, ci.-s : 10
28	0	0	0	0 : v, li.-cl, ci : 0
29	w		10, w	10, ci.-cu, ci.-s, sc, r, st.-w : 10, c.-h.-r, fr.-sqs : vv, r, st.-w

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 49°·0 on the 25th; and the lowest was 27°·5 on the 8th.

The mean ,, was 37°·3, being 2°·5 *higher* than the average of the preceding 27 years.

Elastic Force of Vapour.—The mean for the month was $0^{in}\cdot223$, being $0^{in}\cdot019$ *greater* than the average of the preceding 27 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was $2^{grs}\cdot6$, being $0^{gr}\cdot2$ *greater* than the average of the preceding 27 years.

Degree of Humidity.—The mean for the month was 80 (that of Saturation being represented by 100), being 5 *less* than the average of the preceding 27 years.

Weight of a Cubic Foot of Air.—The mean for the month was 553 grains, being *the same as* the average of the preceding 27 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 6·3.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 0·7.

WIND.

The proportions were of N. 2, S. 10, W. 17, E. 0, and Calm 0. The greatest pressure in the month was $35^{lbs}\cdot0$ on the square foot on the 1st.

RAIN.

Fell on 11 days in the month, amounting to $1^{in}\cdot28$, as measured in the simple cylinder gauge partly sunk below the ground; being $0^{in}\cdot28$ *less* than the average fall of the preceding 53 years.

ELECTRICITY.—The insulating lamp was not burning from February 1 to 12 and 18 to 21.

MONTH and DAY, 1868.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	Osler's. General Direction. P.M.	Osler's. Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
Mar. 1	..	29.730	47.7	34.6	40.1	31.7	79.2	29.8	46.4	45.4	8.4	12.5	4.2	− 0.1	W by S: WNW	W : WSW	8.8	0.0	1.1	512	0.01
2	First Qr.	29.902	53.7	40.3	47.4	42.6	68.4	39.2	45.4	43.9	4.8	8.6	0.0	+ 7.2	WSW	WNW : W	4.5	0.0	1.3	506	0.00
3	Greatest Declination N.	30.069	55.1	43.0	48.0	46.2	68.0	36.2	..	..	1.8	4.2	0.4	+ 7.8	W by S	WSW	7.1	0.0	0.2	325	0.07
4	..	29.970	56.4	46.4	50.0	44.5	69.8	42.0	45.7	44.4	5.5	11.2	0.0	+ 9.9	WSW	WSW	16.5	0.2	1.8	545	0.00
5	..	29.488	57.6	41.0	48.3	42.1	95.0	39.0	46.4	44.4	6.2	15.0	0.0	+ 8.2	SW	WSW	30.0	0.1	3.2	654	0.01
6	Perigee	29.597	51.0	37.4	43.3	34.1	98.3	33.2	46.4	44.4	9.2	16.0	4.6	+ 3.2	W by S : W	WNW : W	12.5	0.1	1.3	524	0.01
7	..	29.492	54.0	35.3	43.9	39.7	77.0	28.6	45.9	45.1	4.2	11.1	0.0	+ 3.7	W	WSW : SW	6.0	0.0	0.4	362	0.03
8	Full	29.112	49.7	35.4	39.5	32.3	83.4	..	44.4	43.4	7.2	12.6	0.0	− 0.8	SW : WNW	W	30.0	0.1	2.9	704	0.17
9	..	29.425	50.6	32.5	40.8	33.4	96.5	28.8	45.6	43.9	7.4	13.9	1.0	+ 0.4	WSW	SW : SSE	1.8	0.0	0.3	309	0.00
10	In Equator	29.322	54.3	36.9	43.9	37.9	109.0	32.5	46.4	44.4	6.0	14.4	0.0	+ 3.3	SE	SSW : SW	1.1	0.0	0.0	181	0.00
11	..	29.194	50.7	35.3	43.8	42.5	58.0	30.0	45.9	43.6	1.3	4.6	0.0	+ 2.9	S : S by E	S by W	13.2	0.0	1.7	530	0.14
12	..	29.602	56.1	39.0	47.0	38.9	104.0	33.9	45.4	44.4	8.1	14.4	2.1	+ 5.8	SW	SW : S by W	4.0	0.0	0.3	387	0.02
13	..	30.015	56.3	42.8	49.8	45.9	69.4	42.6	45.4	44.4	3.9	8.0	0.0	+ 8.4	SSW	SW : SSW	5.0	0.0	0.8	484	0.01
14	..	30.084	51.7	45.0	47.8	44.8	63.5	40.1	45.6	44.6	3.0	4.4	1.9	+ 6.3	S by W	SSW	1.3	0.0	0.1	245	0.02
15	..	30.056	55.8	34.7	42.6	38.6	94.0	32.1	47.4	45.4	4.0	14.4	0.0	+ 0.9	SW	WSW : SW	0.0	0.0	0.0	168	0.00
16	Last Qr.	29.885	51.8	37.2	45.4	44.5	76.1	31.0	47.6	45.6	0.9	5.2	0.0	+ 3.5	SSW : S	SSW : SW	3.4	0.0	0.7	434	0.00
17	Greatest Declination S.	29.827	54.1	36.8	43.7	36.0	96.0	30.2	47.9	45.9	7.7	17.8	2.0	+ 1.7	SW : W	W : WNW	3.9	0.0	0.8	492	0.05
18	Apogee	30.068	52.7	34.9	42.2	34.3	104.0	29.6	47.4	45.4	7.9	17.0	0.0	+ 0.1	NW : N	N : S	0.3	0.0	0.0	217	0.00
19	..	29.747	52.6	32.3	41.9	38.0	98.1	27.1	48.0	45.9	3.9	12.2	0.0	− 0.3	SSW	SSW : SW	1.3	0.0	0.1	283	0.01
20	..	29.777	49.1	32.1	41.4	39.3	69.2	25.0	48.4	46.4	2.1	8.8	0.0	− 0.8	SW	WSW : SW	2.0	0.0	0.1	275	0.01
21	..	29.909	57.8	44.4	50.5	43.9	80.2	44.2	49.1	46.9	6.6	11.8	1.1	+ 8.2	SW	WSW : SW	0.4	0.0	0.0	214	0.00
22	..	29.794	53.1	45.7	48.3	43.9	65.5	40.3	49.4	48.4	4.4	8.4	0.0	+ 6.1	SW	SW	5.2	0.0	0.4	375	0.00
23	..	29.662	51.2	35.0	39.2	33.5	102.0	30.0	49.5	48.4	5.7	16.0	0.0	− 3.0	NW : WSW	W : WNW	11.2	0.0	1.3	524	0.08
24	New : In Equator.	29.805	45.2	31.9	37.5	25.7	78.2	27.0	47.4	46.4	11.8	17.6	5.4	− 4.7	W by N: NNW	N	1.5	0.0	0.2	297	0.00
25	..	29.957	47.7	29.9	38.8	30.9	95.9	21.0	45.4	43.4	7.9	14.3	2.4	− 3.5	N by E	N: WSW: SSW	0.5	0.0	0.0	223	0.02
26	..	29.806	54.6	33.3	43.8	42.7	70.5	30.2	45.7	43.4	1.1	4.8	0.0	+ 1.3	SSW	WNW : W	2.9	0.0	0.1	306	0.41
27	..	29.994	58.5	41.9	48.0	37.8	104.0	35.1	45.4	44.4	10.2	16.2	5.7	+ 5.1	NNW	NNW : N	4.4	0.0	0.4	369	0.00
28	..	30.309	51.0	38.8	43.3	35.1	92.3	34.6	45.4	44.4	8.2	12.2	3.7	+ 0.1	N by W : NNE	NNE : NE	2.5	0.0	0.3	340	0.00
29	..	30.398	51.8	31.1	39.9	33.2	103.0	23.6	45.9	43.9	6.7	13.6	0.0	− 3.7	Calm : NE	NE : Calm	0.2	0.0	0.0	143	0.00
30	..	30.323	51.8	28.1	39.9	35.4	102.1	23.0	46.4	44.4	4.5	15.2	0.0	− 4.1	Calm : NE	NE : Calm	0.0	0.0	0.0	88	0.00
31	Greatest Dec. N. First Quarter.	30.238	57.2	29.2	44.4	38.3	93.0	23.0	46.9	45.1	6.1	15.6	0.0	0.0	Calm	SW : NNW	0.0	0.0	0.0	85	0.00
Means	..	29.824	52.9	36.8	44.0	38.3	85.9	32.1	46.6	45.0	5.7	12.0	1.1	+ 2.4	...	...	..	..	..	Sum 11101	Sum 1.07

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was $30^{in}\cdot086$ on the 3rd; the first minimum in the month was $29^{in}\cdot481$ on the 5th.
The second maximum ,, was $29^{in}\cdot638$ on the 6th; the absolute minimum ,, was $28^{in}\cdot997$ on the 8th.
The third maximum ,, was $29^{in}\cdot510$ on the 9th; the third minimum ,, was $29^{in}\cdot290$ on the 10th.
The fourth maximum ,, was $29^{in}\cdot413$ on the 10th; the fourth minimum ,, was $29^{in}\cdot110$ on the 11th.
The fifth maximum ,, was $30^{in}\cdot102$ on the 14th; the fifth minimum ,, was $29^{in}\cdot787$ on the 17th.
The sixth maximum ,, was $30^{in}\cdot147$ on the 18th; the sixth minimum ,, was $29^{in}\cdot708$ on the 19th.
The seventh maximum ,, was $29^{in}\cdot926$ on the 21st; the seventh minimum ,, was $29^{in}\cdot643$ on the 23rd.
The eighth maximum ,, was $29^{in}\cdot980$ on the 25th; the eighth minimum ,, was $29^{in}\cdot803$ on the 26th.
The absolute maximum ,, was $30^{in}\cdot443$ on the 29th.
The range in the month was $1^{in}\cdot446$.
The mean for the month was $29^{in}\cdot824$, being $0^{in}\cdot081$ *higher* than the average of the preceding 27 years.

TEMPERATURE OF THE AIR.

The highest in the month was $58^{\circ}\cdot5$ on the 27th; the lowest was $28^{\circ}\cdot1$ on the 30th.
The range ,, was $30^{\circ}\cdot4$.
The mean ,, of all the highest daily readings was $52^{\circ}\cdot9$, being $3^{\circ}\cdot2$ *higher* than the average of the preceding 27 years.
The mean ,, of all the lowest daily readings was $36^{\circ}\cdot8$, being $1^{\circ}\cdot6$ *higher* than the average of the preceding 27 years.
The mean daily range was $16^{\circ}\cdot1$, being $1^{\circ}\cdot6$ *greater* than the average of the preceding 27 years.
The mean for the month was $44^{\circ}\cdot0$, being $2^{\circ}\cdot5$ *higher* than the average of the preceding 27 years.

MONTH and DAY, 1868.	ELECTRICITY. A.M.	ELECTRICITY. P.M.	CLOUDS AND WEATHER. A.M.	CLOUDS AND WEATHER. P.M.
March 1			o, w : v, ci, ci.-s, w	10, w : 10, r, w
2			10, w	10, w : v, ci
3			10, r : 10, ci.-s, r	10, oc.-r : 10 : v, li.-cl
4			10, w : 10	10, r, oc.-r : 9, ci.-s : 10, th.-cl, w
5			10, g : 10, sc, ci.-s, g, oc.-r	v,st.-w,ci,ci-cu : v, s : 10, ci.-cu
6			1, ci, w	v, shs.-r, w : vv : o
7		o	1, ci, d : v, th.-cl	10,ci.-cu,cu.-s,ci.-s,h.-r : 10,ci.-cu,cu,ci.-s,cu.-s,th.-r : 10,r
8	w	o	10, h.-sqs, sc : 10, sc, glm, hl, st.-w	v, ci.-cu, cu.-s, st.-w : v, st.-w
9			4, ci, ci.-cu, h	v, ci, ci.-s, ci.-cu, cu.-s : 10, th.-cl
10			v, ci, ci.-s, ci.-cu	8, ci, ci.-s, r, hl : v, li.-cl, oc.-r
11			10 : 10, w, sl.-r	10,sc,w,ci.-s,th.-r : 10, st.-w, r, sc : 10, r
12			o : 6, ci.-cu	v, r, hl, ci, ci-cu : 4, li.-cl
13			10, r, w : 10	9, ci.-s, cu.-s : 10
14	o	m : o	10	10, oc.-r : 10, oc.-r
15	m : m	o	o, h, f : o, h, f, glm	li.-cl : o
16	m : o	o	4, ci, ci.-s : 10, ci.-s, glm	10, glm, th.-r : 10, ci.-cu, s, th.-r, w
17	o	o : w	10, r, w : 6, ci, ci.-cu, ci.-s	vv, li.-cl, sl.-r : v, ci.-cu : o
18	o	o	o : v, ci, ci.-cu, ci.-s	v, ci, ci.-cu : o
19	m : w	o	v, ci, ci.-s, cu.-s, ci.-cu	v, ci.-s, cu.-s, sl.-r : 10, h.-r
20	o	o	10 : 10, sl.-r, th.-cl, ci.-s	10, ci.-cu, ci.-s, shs.-r : 10, th.-r
21	o	o : w	10, ci.-s, glm : 10, ci.-cu, cu.-s. ci.-s	9, li.-cl : 10
22	o	o	10, th.-cl, ci.-cu	10, cu.-s, ci.-cu, glm : v, ci.-cu, w, r
23	o	s N : o	10, w, r : w : v, ci, ci.-cu, r, w	vv,oc.-h.-shs,hl : v, hl : o
24			o, li.-cl, h, h.-fr	10, th.-cl : v, ci, ci.-cu : 5, ci.-cu
25		: w	o, h.-fr : 2, ci, ci.-cu	10, th.-cl : 10, glm, oc.-r, sn
26	w N : o	o	10, c-r : 10, c-r	10, th.-cl, r : v : o
27	w N : o	o	1, ci	v, ci, ci.-cu : v, ci, ci.-cu : v
28			7, ci.-cu, ci.-s, cu.-s, r : v, ci, ci.-cu, ci.-s, cu.-s	10, ci.-s, cu.-s : 10, ci.-s
29			10 : v, ci, ci.-cu, ci.-s	v : o
30			o, h : li.-cl, ci.-cu	1, li.-cl : o : o, d
31			o, h.-fr : o, h	o, h : ci, ci.-s, f : o, sl.-f, h

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 48°·8 on the 3rd; and the lowest was 25°·7 on the 24th.

The mean „ was 38°·3, being 2°·0 *higher* than the average of the preceding 27 years.

Elastic Force of Vapour.—The mean for the month was 0in·231, being 0in·016 *greater* than the average of the preceding 27 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was 2grs·7, being 0gr·2 *greater* than the average of the preceding 27 years.

Degree of Humidity.—The mean for the month was 80 (that of Saturation being represented by 100), being 2 *less* than the average of the preceding 27 years.

Weight of a Cubic Foot of Air.—The mean for the month was 549 grains, being 1 grain *less* than the average of the preceding 27 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 6·4.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 0·8.

WIND.

The proportions were of N. 4, S. 10, W. 14, E. 1, and Calm 2. The greatest pressure in the month was 30lbs·0 on the square foot on the 5th and 8th.

RAIN.

Fell on 16 days in the month, amounting to 1in·07, as measured in the simple cylinder gauge partly sunk below the ground; being 0in·54 *less* than the average fall of the preceding 53 years.

ELECTRICITY.—The insulating lamp was not burning from March 1 to 6, 9 to 13, on March 24, and from 28 to 31.

MONTH and DAY, 1868.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	Osler's. General Direction. P.M.	Osler's. Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
April 1	..	30·212	55·0	39·2	47·0	39·2	80·5	31·0	46·9	45·4	7·8	14·0	3·2	+ 2·4	NNW	NNE : Calm	0·0	0·0	0·0	102	0·00
2	..	30·246	56·8	39·3	46·8	40·3	102·0	30·5	47·3	45·4	6·5	17·8	0·0	+ 2·0	ENE	E : ESE	0·2	0·0	0·0	171	0·00
3	Perigee	30·061	61·1	38·6	47·6	41·7	119·0	37·5	47·4	45·9	5·9	16·5	0·2	+ 2·6	ENE	E : ESE	0·4	0·0	0·0	184	0·00
4	..	29·895	67·8	33·5	50·5	41·7	109·5	27·0	48·2	46·4	8·8	21·4	0·0	+ 5·3	Calm	SW	0·0	0·0	0·0	108	0·00
5	..	29·878	66·6	38·2	51·4	41·4	113·0	32·5	48·4	46·4	10·0	20·1	0·0	+ 6·0	W by S	W by S	0·7	0·0	0·0	229	0·00
6	In Equator	29·803	64·8	42·3	52·3	46·0	103·6	38·0	49·4	47·9	6·3	17·5	0·0	+ 6·9	WSW	WNW : WSW	2·3	0·0	0·2	316	0·00
7	Full	29·584	64·9	42·7	53·1	44·3	122·0	36·6	50·4	47·9	8·8	19·6	0·0	+ 7·7	SW : SSW	SSW	2·2	0·0	0·2	267	0·00
8	..	29·270	56·5	36·0	42·6	40·7	115·0	36·0	51·4	50·4	1·9	9·7	0·0	− 2·8	S	NE : N : N by E	4·8	0·0	0·8	325	0·37
9	..	29·670	49·2	34·7	39·6	34·3	111·5	32·6	50·4	48·4	5·3	13·0	0·0	− 5·7	N : N by W	N	4·2	0·0	0·9	422	0·02
10	..	29·857	52·5	33·2	40·6	31·6	120·2	28·1	49·9	47·4	9·0	18·0	3·3	− 4·6	N	N : N by W : NNE	1·9	0·0	0·2	293	0·00
11	..	29·883	48·7	32·9	40·0	32·3	94·5	25·5	48·9	46·4	7·7	14·1	2·7	− 5·1	N : N by W	NE	0·8	0·0	0·0	165	0·00
12	..	29·855	44·2	28·9	37·3	29·4	61·0	20·0	48·9	46·9	7·9	11·3	1·4	− 7·7	NNE : N.	N by E	0·3	0·0	0·0	204	0·00
13	Greatest Declination S.	29·871	52·8	34·5	41·6	33·4	112·2	31·0	48·4	46·4	8·2	16·6	3·1	− 3·3	N by W : N	NNE	1·7	0·0	0·2	302	0·00
14	Last Qr.	30·063	57·8	36·0	45·9	37·0	126·0	28·0	48·4	46·4	8·9	17·8	0·0	+ 0·9	NNE	N : NNE : SE	0·0	0·0	0·0	132	0·00
15	Apogee	30·176	62·5	31·5	46·8	41·3	119·0	24·0	48·9	46·8	5·5	17·1	0·0	+ 1·5	Calm	NE : SSW	0·0	0·0	0·0	107	0·00
16	..	29·935	61·1	44·3	52·3	49·7	74·2	36·5	49·4	48·4	2·6	8·7	0·0	+ 6·8	WSW : NW	NNW	1·2	0·0	0·1	273	0·00
17	..	29·773	58·7	46·0	50·8	48·0	85·0	43·0	48·9	47·1	2·8	8·7	0·0	+ 5·1	NNW : N	N : NNW	0·6	0·0	0·0	167	0·10
18	..	29·682	54·3	38·0	45·2	43·9	93·6	35·0	49·4	47·4	1·3	8·2	0·0	− 0·8	NW : E	E : E by S	0·8	0·0	0·1	172	0·00
19	..	29·212	57·8	41·7	48·1	45·9	111·8	37·0	49·4	48·4	2·2	8·2	0·0	+ 1·7	SE : S by E : S by W	S : SSE	25·0	0·0	0·8	386	0·14
20	In Equator	28·913	57·1	44·1	48·7	41·6	90·0	43·1	50·4	49·4	7·1	11·6	0·9	+ 2·0	S : SSW : SW	WSW : SW	30·0	0·2	2·2	639	0·51
21	..	29·456	63·8	44·8	53·2	44·3	128·0	39·0	51·4	49·4	8·9	15·7	2·0	+ 6·2	SSW : SW	SW	30·0	0·2	3·0	687	0·63
22	New	29·558	61·2	49·3	54·0	50·1	82·5	43·0	51·9	49·9	3·9	9·7	0·0	+ 6·8	SSW	SSW	30·0	0·0	1·3	454	0·02
23	..	29·566	61·6	44·1	49·6	43·7	124·0	40·0	52·1	50·1	5·9	14·2	3·5	+ 2·2	SW	SW : S	19·8	0·0	1·2	421	0·16
24	..	29·391	59·5	45·1	50·0	44·8	109·7	39·0	52·4	50·4	5·2	12·3	0·0	+ 2·4	S : SE	SSE : E : NE	1·3	0·0	0·1	200	0·01
25	..	29·882	55·2	43·9	47·5	40·9	101·0	36·0	52·4	50·4	6·6	11·8	2·4	− 0·2	N : NNW	NNE : SE : SW	1·6	0·0	0·1	177	0·00
26	..	30·010	62·9	44·8	52·2	42·4	110·3	41·5	..	..	9·8	16·3	3·5	+ 4·3	Calm	NE : S	0·1	0·0	0·0	96	0·00
27	Greatest Declination N.	29·939	62·4	41·3	50·1	41·3	120·0	36·0	52·7	51·4	8·8	15·8	5·8	+ 2·0	SSW	SSW : WSW	30·0	0·0	1·0	363	0·12
28	..	29·899	54·8	38·7	46·2	43·4	100·5	..	53·4	51·4	2·8	8·4	0·0	− 2·2	WSW	SSW : SW : WSW	2·4	0·0	0·6	358	0·00
29	Perigee ; First Quarter.	29·959	64·6	49·7	55·3	43·2	129·0	45·7	52·7	51·1	12·1	19·8	4·2	+ 6·5	WSW	WSW : SW	30·0	0·0	1·8	511	0·00
30	..	29·956	68·9	47·2	56·2	44·9	134·0	42·0	53·4	51·4	11·3	20·3	3·1	+ 6·9	WSW	WSW	30·0	0·1	2·4	565	0·00
Means	..	29·782	58·8	40·1	48·1	41·4	106·8	35·0	50·1	48·3	6·7	14·5	1·3	+ 1·9	...	...	..	..	..	Sum 8796	Sum 2·08

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The absolute maximum in the month was 30in·278 on the 2nd; the first minimum in the month was 30in·204 on the 1st.
The second maximum ,, was 29in·906 on the 11th; the second minimum ,, was 29in·230 on the 8th.
The third maximum ,, was 30in·216 on the 15th; the third minimum ,, was 29in·852 on the 13th.
The fourth maximum ,, was 29in·620 on the 22nd; the absolute minimum ,, was 28in·749 on the 20th.
The fifth maximum ,, was 29in·619 on the 23rd; the fifth minimum ,, was 29in·481 on the 22nd.
The sixth maximum ,, was 30in·040 on the 26th; the sixth minimum ,, was 29in·354 on the 24th.
The seventh maximum ,, was 29in·981 on the 28th; the seventh minimum ,, was 29in·884 on the 27th.
the eighth minimum ,, was 29in·824 on the 28th.
The range in the month was 1in·529.
The mean for the month was 29in·782, being 0in·019 *higher* than the average of the preceding 27 years.

TEMPERATURE OF THE AIR.

The highest in the month was 68°·9 on the 30th; the lowest was 28°·9 on the 12th.
The range ,, was 40°·0.
The mean ,, of all the highest daily readings was 58°·8, being 1°·3 *higher* than the average of the preceding 27 years.
The mean ,, of all the lowest daily readings was 40°·1, being 1°·0 *higher* than the average of the preceding 27 years.
The mean daily range was 18°·7, being 0°·3 *greater* than the average of the preceding 27 years.
The mean for the month was 48°·1, being 1°·2 *higher* than the average of the preceding 27 years.

MONTH and DAY, 1868.	ELECTRICITY A.M.	ELECTRICITY P.M.	CLOUDS AND WEATHER. A.M.	CLOUDS AND WEATHER. P.M.
April 1	o	o	10, li.-cl, h : 10, ci, ci.-cu	10, ci, ci.-s, ci.-cu : 10
2	o	o : w	10, ci.-s, ci.-cu	9, ci.-s, ci.-cu : o : 10, th.-cl, d
3	o	o	9, ci.-s, cu.-s, d	o : o
4	m	o	o. sl.-f, h : o, h	1, th.-cl, h : o
5	o	o	o : o, f	o : o, f : li.-cl
6	w	o : m	4, ci, ci.-cu, ci.-s	8, ci.-cu, ci, ci.-s : ci.-s, d
7	o	o	9, ci.-cu, ci.-s, d	6, ci, ci.-s : v, ci.-cu, ci.-s, cu.-s, r
8	w	m	10 : 10, cu.-s, h.-r, hl	10, r : 10, th.-r, w
9	o : ss N, ss P, sp, g.-cur	ss P, m N, sp, g-cur	10, w : 7, ci, ci.-s, ci.-cu, h.-r, hl	8, ci.-s, ci.-cu, ci, cu.-s, shs.-r, hl, sqs : 4, ci.-cu, s, r
10			6, ci, ci.-cu, cu.-s	vv, ci, ci.-s, ci.-cu, cu.-s : vv, ci.-cu, ci.-s, r, sn
11		w : w	v : 10, ci.-s, cu.-s	10, r, ci.-s : 10, ci.-cu, ci.-s, cu.-s, th.-r : 8
12	o	o	10	10 : 10
13	o	o	10 : li.-cl, ci.-s, ci	10, ci.-cu, cu.-s : 10, oc.-r
14			6, ci, ci.-cu, ci.-s	6, ci, ci.-cu, ci.-s : v : o
15			o, h : o, h	o, h : o
16			10 : 10, sl.-r	10, th.-cl, ci.-cu : 5, th.-cl
17			10, th.-cl : 10, th.-cl, glm	10, gt.-glm, r : 10, h.-r
18	w	m : m	10, th.-cl, oc.-r	10, ci.-s, ci.-cu : o : o
19	w : ss N, sp, g.-cur	o	8, ci.-cu, cu.-s, ci, r	10, ci.-cu, ci.-s, h.-r, w : 10, c.-h.-r, st.-w
20	sN	w : o	10, h.-r, sc, st.-w : 10, r, sc, st.-w	10, st.-w : v, w : o, ms, w
21	o	o	vv, h.-shs, w : vv, ci.-cu, cu.-s, st.-w, h.-r	vv, ci.-cu, cu.-s, g, oc.-r : 6, ci.-cu, cu.-s, g : vv, th.-cl, w
22	o	o	10, sc, th.-r : 10, h.-shs, w	10, th.-cl, st.-w : 6, th.-cl, oc.-r, st.-w
23	o : ss P, ss N, sp, g.-cur	ss N, ss P, sp, g.-cur : o	8, ci.-cu, ci.-s, cu.-s, w : v, ci, ci.-cu, ci.-s, oc.-shs, w	10, ci, ci.-cu, ci.-s, cu.-s, oc.-shs : v, h.-shs, hl : o
24			10, oc.-r	10 : 10
25			10	9, ci.-cu, ci.-s : v, th.-cl
26			3, li.-cl, h : v, ci, ci.-cu, h	v, ci, ci.-s
27			8, ci, h	10, ci.-s, cu.-s, shs.-r : v, ci, ci.-s, cu.-s, h.-shs, hl, st.-w : 8, ci.-s, cu.-s, shs.-r, s, w
28			10 : 10, r	10, r : 10, r : 10, w
29			7, ci, ci.-cu : v, ci.-cu, ci, st.-w	8, ci, ci.-cu, w : v, li.-cl : o, st.-w
30			g : 4, ci, ci.-cu, ci.-s, st.-w	7, ci, ci.-s, ci.-cu, w : v, ci, ci.-s : 10, ci, ci.-s

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 52°·5 on the 16th and 22nd; and the lowest was 28°·6 on the 12th.
The mean ,, was 41°·4, being 0°·9 *higher* than the average of the preceding 27 years.

Elastic Force of Vapour.—The mean for the month was 0in·261, being 0in·009 *greater* than the average of the preceding 27 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was 3grs·0, being 0gr·1 *greater* than the average of the preceding 27 years.

Degree of Humidity.—The mean for the month was 78 (that of Saturation being represented by 100), being 1 *less* than the average of the preceding 27 years.

Weight of a Cubic Foot of Air.—The mean for the month was 543 grains, being *the same* as the average of the preceding 27 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 6·9.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 1·6.

WIND.

The proportions were of N. 8, S. 8, W. 8, E. 4, and Calm 2. The greatest pressure in the month was 30lbs·0 on the square foot on the 20th, 21st, 22nd, 27th, 29th, and 30th.

RAIN.

Fell on 10 days in the month, amounting to 2in·08, as measured in the simple cylinder gauge partly sunk below the ground; being 0in·34 *greater* than the average fall of the preceding 53 years.

ELECTRICITY.—The insulating lamp was not burning on April 10, from April 14 to 17 and 24 to 30.

MONTH and DAY, 1868.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer, with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	Osler's. General Direction. P.M.	Osler's. Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
May 1	..	30·107	66·6	49·3	55·5	45·9	115·9	44·2	53·9	51·7	9·6	17·3	4·6	+ 5·7	WSW	WSW	2·7	0·0	0·6	344	0·00
2	..	29·990	70·4	40·6	55·5	49·1	134·0	35·2	54·4	52·4	6·4	18·5	0·9	+ 5·2	Calm : S	SE	0·9	0·0	0·0	146	0·00
3	In Equator	29·707	82·3	43·7	63·4	53·8	144·0	40·0	57·4	54·4	9·6	24·3	0·0	+12·6	Calm	SW : NNE	1·9	0·0	0·1	172	0·00
4	..	29·879	65·3	43·0	51·2	42·1	127·2	..	57·9	55·9	9·1	16·5	4·0	0·0	NNE	E : ENE	2·2	0·0	0·4	285	0·00
5	..	30·012	58·1	41·4	48·2	37·1	125·0	37·0	56·6	55·4	11·1	18·2	3·3	− 3·3	ENE	ENE	19·2	0·0	1·6	440	0·00
6	Full	30·023	55·8	39·4	46·2	37·2	133·1	35·5	56·4	54·8	9·0	15·0	4·6	− 5·5	ENE	E by N	12·0	0·0	1·2	371	0·00
7	..	29·816	65·1	33·9	49·5	41·4	136·0	33·0	56·4	54·4	8·1	21·7	1·7	− 2·2	NE : E	E	0·7	0·0	0·1	162	0·00
8	..	29·658	74·2	35·9	56·3	47·5	141·2	34·0	56·8	54·4	8·8	25·6	0·0	+ 4·6	ENE : ESE	E : Calm	0·5	0·0	0·0	123	0·00
9	..	29·614	73·2	49·5	58·6	53·5	131·3	40·0	56·4	54·6	5·1	13·1	0·0	+ 7·1	WSW	WSW : SSW	0·5	0·0	0·0	174	0·03
10	Greatest Declination S.	29·665	68·0	46·8	55·4	51·4	115·5	40·0	56·9	54·9	4·0	10·8	0·2	+ 4·1	Calm : SW	SSW	0·3	0·0	0·0	143	0·00
11	..	29·711	65·8	43·2	54·3	45·0	125·0	41·1	57·1	55·4	9·3	18·4	2·4	+ 3·1	Calm : SSE	S : SSW	2·1	0·0	0·2	216	0·00
12	..	29·752	71·9	42·1	56·5	48·1	147·0	40·6	57·4	56·4	8·4	20·2	0·9	+ 5·3	Calm : S	SSW	2·0	0·0	0·1	218	0·00
13	Apogee	30·018	71·6	42·9	55·9	45·7	151·0	35·1	57·4	55·4	10·2	18·4	0·4	+ 4·5	SW : WSW	SW : SSW	2·1	0·0	0·2	246	0·00
14	Last Qr.	30·169	73·2	48·5	58·3	53·5	121·0	..	58·4	56·4	4·8	15·6	0·0	+ 6·6	SW	SW	0·3	0·0	0·0	174	0·00
15	..	30·040	77·2	46·8	61·8	54·3	147·5	39·4	58·4	56·4	7·5	19·0	2·3	+ 9·8	WSW : SSW	SSW	0·5	0·0	0·1	153	0·00
16	..	29·899	70·0	53·0	60·6	53·8	131·7	50·6	60·4	58·4	6·8	14·4	1·6	+ 8·3	WSW : N	N : NNE : Calm	0·4	0·0	0·0	127	0·00
17	..	29·977	70·6	50·2	59·8	48·6	137·0	42·8	60·9	59·4	11·2	16·0	1·4	+ 7·2	NE	E	2·0	0·0	0·2	219	0·00
18	In Equator	29·963	71·7	45·6	58·6	52·8	148·2	45·5	61·4	60·4	5·8	15·2	1·5	+ 5·7	ENE : E	E : E by S	2·2	0·0	0·3	224	0·00
19	..	29·829	87·0	53·0	71·4	47·6	157·0	46·0	61·9	60·7	23·8	38·0	0·2	+18·2	Calm : S	S : SE	2·6	0·0	0·3	210	0·00
20	..	29·811	75·4	48·0	59·0	50·0	141·0	46·2	61·9	60·8	9·0	21·1	3·2	+ 5·5	SW : WSW	WSW : SW	2·1	0·0	0·2	257	0·00
21	..	29·776	72·4	42·4	56·0	45·9	145·1	36·5	63·4	61·4	10·1	23·5	0·7	+ 2·2	SW	SW : SSW	2·5	0·0	0·3	258	0·00
22	New	29·652	66·1	51·6	57·7	52·9	112·5	49·5	62·7	60·9	4·8	11·9	0·2	+ 3·6	SSW	SSW	1·7	0·0	0·2	259	0·20
23	..	29·441	62·9	47·5	53·5	51·5	88·2	46·0	62·4	60·4	2·0	7·0	0·0	− 0·8	SSW	SSW : WSW	13·9	0·0	1·2	407	0·06
24	Greatest Declination N.	29·517	61·6	45·1	53·6	53·2	95·5	36·5	61·4	60·4	0·4	5·1	0·0	− 1·0	S : SSE	SSW	14·0	0·0	0·7	305	0·29
25	Perigee	29·665	69·8	49·0	57·6	50·3	143·2	48·5	60·9	59·5	7·3	14·8	1·8	+ 2·7	SW	SW	14·2	0·0	1·2	431	0·01
26	..	29·869	69·8	47·0	58·0	48·3	141·0	40·0	61·4	61·4	9·7	17·8	2·3	+ 2·8	SSW	SSW : SW	2·4	0·0	0·3	290	0·00
27	..	30·003	76·1	45·4	58·2	48·1	146·0	36·2	60·9	58·9	10·1	21·9	1·1	+ 2·8	SW	SW : SSW	1·8	0·0	0·2	226	0·00
28	First Qr.	30·052	74·9	46·0	61·0	50·9	145·6	38·0	61·4	59·9	10·1	20·6	1·5	+ 5·3	SW : NE : SE	E : ESE	1·4	0·0	0·2	178	0·00
29	..	29·803	74·3	51·8	63·6	58·1	107·0	44·7	62·4	61·4	5·5	12·2	2·0	+ 7·6	E	E : SE	2·2	0·0	0·1	134	1·08
30	..	29·848	73·2	54·6	62·3	52·2	127·0	48·6	63·4	62·4	10·1	17·8	1·8	+ 6·0	WSW : N	NNW : E	0·8	0·0	0·0	174	0·00
31	In Equator	29·916	71·3	52·9	59·2	50·1	115·5	48·8	63·4	62·4	9·1	17·6	2·8	+ 2·6	NNE : NE	E : ESE	0·7	0·0	0·0	183	0·00
Means	..	29·845	70·5	46·1	57·3	49·0	131·5	41·4	59·4	57·8	8·3	17·7	1·5	+ 4·4	...	...	..	..	..	Sum 7249	Sum 1·67

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was $30^{in}\cdot126$ on the 1st; the first minimum in the month was $29^{in}\cdot680$ on the 3rd.
The second maximum ,, was $30^{in}\cdot071$ on the 6th; the second minimum ,, was $29^{in}\cdot595$ on the 9th.
The absolute maximum ,, was $30^{in}\cdot175$ on the 14th; the third minimum ,, was $29^{in}\cdot883$ on the 16th.
The fourth maximum ,, was $30^{in}\cdot007$ on the 18th; the absolute minimum ,, was $29^{in}\cdot375$ on the 23rd.
The fifth maximum ,, was $29^{in}\cdot560$ on the 23rd; the fifth minimum ,, was $29^{in}\cdot488$ on the 24th.
The sixth maximum ,, was $30^{in}\cdot099$ on the 28th; the sixth minimum ,, was $29^{in}\cdot754$ on the 29th.
The seventh maximum ,, was $29^{in}\cdot944$ on the 31st.
The range in the month was $0^{in}\cdot800$.
The mean for the month was $29^{in}\cdot845$, being $0^{in}\cdot071$ *higher* than the average of the preceding 27 years.

TEMPERATURE OF THE AIR.

The highest in the month was 87°·0 on the 19th; the lowest was 33°·9 on the 7th.
The range ,, was 53°·1.
The mean ,, of all the highest daily readings was 70°·5, being 6°·0 *higher* than the average of the preceding 27 years.
The mean ,, of all the lowest daily readings was 46°·1, being 1°·9 *higher* than the average of the preceding 27 years.
The mean daily range was 24°·4, being 4°·1 *greater* than the average of the preceding 27 years.
The mean for the month was 57°·3, being 4°·4 *higher* than the average of the preceding 27 years.

MONTH and DAY, 1868.	ELECTRICITY. A.M.	ELECTRICITY. P.M.	CLOUDS AND WEATHER. A.M.	CLOUDS AND WEATHER. P.M.
May 1			10, ci.-s, ci	5, ci.-cu, cu, cu.-s : 6, ci.-cu, ci.-s
2			o : o	o : o
3			o	o : o
4			6, ci, ci.-s	o : o, h
5			6, ci, ci.-cu, ci.-s, st.-w	7, ci, ci.-cu, ci.-s, st.-w : 2, ci.-s, h, w
6			8, ci.-cu, ci.-s, st.-w	o, w : v, li.-cl, ci : 2, li.-cl, ci
7			1, ci, ci.-s, d : o	o : o
8	o	o : m	o, h, f, d : o, sl.-f, d	o : 1, s, ci.-s
9	w	w : m	10, r : 9, ci.-s, cu.-s	9, ci, ci.-s, ci.-cu : v, ci,ci.-s,ci.-cu,cu.-s: 8, ci, ci.-s, cu.-s
10	o	o	10 : 10, cu.-s, r	v, r : 2, ci.-s
11	w	w : o	v, ci, ci.-cu, ci.-s	8, ci, ci.-cu, ci.-s : v, ci, ci.-s
12	o	w : o : w	3, ci, ci.-s, ci.-cu	5, ci, ci.-s, ci.-cu : v, ci.-s, cu.-s
13	o	o	3, ci, ci.-cu, ci.-s	9, ci.-cu : 9, ci.-cu
14	o	o	10, ci, ci.-s : 10	9, ci, ci.-cu, ci.-s : 4, ci.-cu, s
15	o	o	4, ci, ci.-cu : v, ci, ci.-cu, ci.-s, cu.-s	2, ci, ci.-cu : o : o
16	o	o	v, ci.-cu, ci, ci.-s, cu.-s : 10, h	10, ci.-s : 10, ci.-s
17	o	o	v, ci, ci.-cu	9, ci, ci.-cu, ci.-s : o
18	o	o	o	o : li.-cl, ci : o
19	o	o	o, ms : 2, ci, ci.-cu	2, ci,cu,ci.-cu, ci.-s : 4, ci,ci.-cu,ci.-s,cu.-s: v, li.-cl, l
20	o	o	o, l : 9, ci.-s,cu.-s,ci.-cu,r: 6, ci, ci.-cu, ci.-s	v, ci, ci.-cu, ci.-s : v : v, li.-cl, a
21	o	o	4, ci, ci.-cu, ci.-s, cu	5, ci,ci.-cu,ci.-s,cu,cu.-s: vv :9,ci.-s,cu.-s,ci.-cu,r
22	o	o	o : shs.-r : 10,cu.-s,ci.-cu,ci.-s	10, cu.-s, ci.-s, oc.-r : 10, c.-h.-r: 10, cu.-s
23	o		10 : 10, th.-r, w	10, r, st.-w : v, li.-cl, w : 3, li.-cl, ci
24			10 : 10, r	10, oc.-r : 10, r, sc, st.-w
25			10, cu.-s, oc.-shs : 7, cu.-s, ci.-cu, ci, w	6, ci.-cu, ci, w : 1, ci, ci.-cu, w : o
26			v, ci, ci.-cu	v, ci : o
27			3, ci, ci.-cu, cu.-s, ci.-s	v, ci, ci.-cu : v, ci, ci.-s, ci.-cu: o
28			o : o	o : 1, ci, ci.-s
29			10 : 10, r, t	10, h.-r, t.-s : 10, h.-r, t, l : 10, l
30	o	o	8, ci, ci.-s	7, ci, ci.-s : 7, ci, ci.-s : 7, ci,ci.-s,ci.-cu
31	o	o	9, ci.-cu, cu.-s	7, ci.-cu, h : o, h

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 60°·7 on the 29th; and the lowest was 36°·2 on the 5th.

The mean ,, was 49°·0, being 3°·5 *higher* than the average of the preceding 27 years.

Elastic Force of Vapour.—The mean for the month was $0^{in}\cdot348$, being $0^{in}\cdot046$ *greater* than the average of the preceding 27 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was $3^{grs}\cdot9$, being $0^{gr}\cdot5$ *greater* than the average of the preceding 27 years.

Degree of Humidity—The mean for the month was 74 (that of Saturation being represented by 100), being 2 *less* than the average of the preceding 27 years.

Weight of a Cubic Foot of Air.—The mean for the month was 534 grains, being 8 grains *less* the average of the preceding 27 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 4·9.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 1·9.

WIND.

The proportions were of N. 3, S. 11, W. 7, E. 8, and Calm 2. The greatest pressure in the month was $19^{lbs}\cdot2$ on the square foot, on the 5th.

RAIN.

Fell on 6 days in the month, amounting to $1^{in}\cdot67$, as measured in the simple cylinder gauge partly sunk below the ground; being $0^{in}\cdot49$ *less* than the average fall of the preceding 53 years.

ELECTRICITY.—The insulating lamp was not burning from May 1 to 7, and 24 to 29.

MONTH and DAY, 1868.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	READINGS OF THERMOMETERS. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Greatest.	Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	WIND AS DEDUCED FROM ANEMOMETERS. OSLER'S. General Direction. A.M.	P.M.	Pressure in lbs. on the square foot. Greatest.	Least.	Mean of 24 Obs.	ROBINSON'S. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
June 1	..	29·813	73·9	44·7	58·8	53·4	142·9	36·2	63·4	62·4	5·4	17·7	1·5	+ 1·8	ENE	ENE : ESE	0·8	0·0	0·0	144	0·00
2	..	29·795	71·7	51·5	57·9	52·4	124·9	46·0	63·7	63·4	5·5	17·3	1·0	+ 0·6	S:WSW:WNW	NW : NNW	1·2	0·0	0·1	203	0·04
3	..	29·935	73·9	47·5	58·1	45·5	148·3	45·4	63·4	62·4	12·6	23·3	2·1	+ 0·7	NNW	SW : SSW	1·3	0·0	0·1	210	0·00
4	..	29·869	61·3	47·7	54·4	54·2	82·0	40·5	62·9	61·7	0·2	4·9	0·0	− 2·9	SSW	SSW : SW	2·1	0·0	0·3	259	0·10
5	Full	30·010	71·4	49·4	58·9	46·9	122·0	46·0	62·4	61·4	12·0	23·0	1·5	+ 1·7	N : NNW	W : WSW	0·9	0·0	0·0	139	0·00
6	..	30·034	78·4	47·9	62·7	53·1	146·1	40·4	61·9	61·1	9·6	21·1	2·1	+ 5·7	SW	WSW	1·6	0·0	0·3	276	0·00
7	Greatest Declination S.	30·008	72·9	53·8	60·0	47·6	135·0	51·8	61·4	60·4	12·4	20·7	3·4	+ 3·0	WSW : NNW	NNW	2·3	0·0	0·2	237	0·00
8	..	30·036	66·3	45·6	53·8	40·3	126·1	35·8	60·4	59·4	13·5	22·5	6·2	− 3·5	NNW	NNW	1·1	0·0	0·3	277	0·00
9	..	30·014	69·5	45·3	56·3	45·9	125·0	35·5	60·4	59·4	10·4	22·3	0·0	− 1·4	WSW : NW	NW : N by W	0·6	0·0	0·0	149	0·00
10	Apogee	30·003	77·0	46·6	59·9	48·0	147·0	42·5	60·3	58·7	11·9	25·5	4·0	+ 1·9	NNW : NNE	SW : WNW	0·8	0·0	0·0	136	0·00
11	..	30·050	74·4	46·6	59·8	50·0	129·2	37·1	60·9	59·9	9·8	24·0	4·0	+ 1·5	WSW : N	NNW : N by E : W	1·3	0·0	0·0	144	0·00
12	..	30·082	76·6	54·9	64·1	49·9	130·0	45·4	62·4	61·4	14·2	24·0	5·4	+ 5·5	N by W	N : SSW	0·5	0·0	0·0	164	0·00
13	Last Qr.	30·047	85·1	50·8	68·2	49·1	148·8	42·0	64·4	62·4	19·1	30·5	2·0	+ 9·4	SW	WSW : W	0·6	0·0	0·0	149	0·00
14	In Equator	30·036	85·5	55·1	68·8	53·5	159·9	..	64·4	62·4	15·3	29·9	4·8	+ 9·8	SW	WSW : SW	2·3	0·0	0·3	246	0·00
15	..	30·065	78·9	51·6	64·6	53·3	146·4	43·2	64·9	62·4	11·3	24·3	2·4	+ 5·6	SW : WSW	W : NW	1·0	0·0	0·1	241	0·00
16	..	30·087	78·8	52·3	65·9	57·4	147·0	43·0	65·7	64·4	8·5	20·4	1·0	+ 6·9	Calm : NE	NE : SE	0·1	0·0	0·0	123	0·00
17	..	30·010	83·2	57·1	68·7	56·8	153·4	49·5	65·4	64·4	11·9	24·6	2·7	+ 9·7	WSW : W	W : N : NNE	0·5	0·0	0·0	174	0·00
18	..	30·116	75·1	53·4	62·4	50·4	152·9	44·3	65·7	64·4	12·0	23·3	4·4	+ 3·3	NE : ENE	ENE	2·6	0·0	0·5	298	0·00
19	..	30·028	71·2	49·2	59·7	51·8	149·0	45·1	66·4	65·4	7·9	19·6	1·5	+ 0·5	ENE	ENE	6·5	0·0	0·7	327	0·00
20	New	29·877	88·0	53·8	67·4	61·3	165·3	48·2	67·4	66·4	6·1	20·7	0·2	+ 7·9	NE : SW	SW	1·2	0·0	0·1	150	0·04
21	Greatest Declination N.	29·716	84·0	56·5	69·9	58·0	128·3	50·8	66·4	64·4	11·9	21·6	1·5	+10·0	SW : S	S by W : S	2·0	0·0	0·2	210	0·00
22	Perigee	29·552	69·2	55·8	58·8	53·5	110·0	50·0	66·6	64·6	5·3	13·0	1·2	− 1·5	SSW	SSW : SW	1·7	0·0	0·1	246	0·21
23	..	29·634	72·4	48·4	58·8	49·2	149·1	39·0	66·9	64·4	9·6	21·4	0·0	− 1·9	SW	SW	1·7	0·0	0·1	179	0·08
24	..	29·893	75·8	48·5	60·4	52·6	135·0	44·8	67·3	65·4	7·8	20·1	0·0	− 0·8	SW : WSW	SW : SSW	1·6	0·0	0·1	242	0·00
25	..	30·026	76·1	55·2	63·2	52·9	127·0	..	67·4	66·4	10·3	18·5	1·4	+ 1·6	SW : WSW	W : WSW	2·7	0·0	0·2	272	0·00
26	..	30·171	79·7	50·9	64·2	52·0	145·0	..	68·0	66·6	12·2	25·2	2·2	+ 2·5	N : NE	NE : SSE	0·1	0·0	0·0	113	0·00
27	First Quarter; In Equator.	30·091	88·0	51·0	69·8	49·8	157·5	43·1	66·9	65·7	20·0	32·0	2·6	+ 8·2	SW	W: NW: WSW	0·8	0·0	0·1	193	0·00
28	..	30·095	77·6	55·0	63·8	51·1	150·5	53·0	67·4	66·4	12·7	23·1	5·0	+ 2·3	N	N : NNE	1·6	0·0	0·3	248	0·00
29	..	30·174	75·2	49·5	60·1	48·7	150·9	49·5	66·5	65·7	11·4	24·6	2·9	− 1·3	NNE	NE : SE	2·1	0·0	0·3	243	0·00
30	..	30·141	76·9	47·8	61·4	52·1	163·5	39·8	66·4	65·4	9·3	21·6	0·2	+ 0·3	Calm : NNE	NNE : N	2·5	0·0	0·4	258	0·00
Means	..	29·980	76·3	50·8	62·0	51·4	139·9	44·0	64·6	63·3	10·7	22·0	2·2	+ 2·9	...	...	..	..	..	Sum 6250	Sum 0·47

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was $29^{in}\cdot973$ on the 3rd; the first minimum in the month was $29^{in}\cdot765$ on the 2nd.
The second maximum ,, was $30^{in}\cdot066$ on the 6th; the second minimum ,, was $29^{in}\cdot855$ on the 4th.
The third maximum ,, was $30^{in}\cdot109$ on the 12th; the third minimum ,, was $29^{in}\cdot977$ on the 10th.
The fourth maximum ,, was $30^{in}\cdot127$ on the 16th; the fourth minimum ,, was $30^{in}\cdot009$ on the 14th.
The fifth maximum ,, was $30^{in}\cdot131$ on the 18th; the fifth minimum ,, was $29^{in}\cdot997$ on the 17th.
The sixth maximum ,, was $30^{in}\cdot183$ on the 26th; the absolute minimum ,, was $29^{in}\cdot538$ on the 22nd.
The absolute maximum ,, was $30^{in}\cdot205$ on the 29th; the seventh minimum ,, was $30^{in}\cdot050$ on the 27th.

The range in the month was $0^{in}\cdot667$.

The mean for the month was $29^{in}\cdot980$, being $0^{in}\cdot179$ *higher* than the average of the preceding 27 years.

TEMPERATURE OF THE AIR.

The highest in the month was 88°·0 on the 20th and 27th; the lowest was 44°·7 on the 1st.

The range ,, was 43°·3.

The mean ,, of all the highest daily readings was 76°·3, being 5°·3 *higher* than the average of the preceding 27 years.

The mean ,, of all the lowest daily readings was 50°·8, being 0°·6 *higher* than the average of the preceding 27 years.

The mean daily range was 25°·5, being 4°·6 *greater* than the average of the preceding 27 years.

The mean for the month was 62°·0, being 2°·9 *higher* than the average of the preceding 27 years.

MONTH and DAY, 1868.	ELECTRICITY.		CLOUDS AND WEATHER.	
	A.M.	P.M.	A.M.	P.M.
June 1	o	o	v, ci.-cu, ci	v, ci : o
2	wN	w : o	10, oc.-r : 10, h.-r	9, ci.-cu, ci.-s : 9, ci.-cu, ci.-s
3			3, ci-cu, ci.-s, cu.-s	7, ci.-cu, ci.-s, cu.-s : v, ci.-cu, ci, ci.-s : o
4			10 : 10, r	10, r : 10, r
5	o	o	o : o	o : o
6	o	o : w	2, ci.-s, ci.-cu, ci, cu	3, ci.-cu, ci.-s : v, li.-cl : v, ci.-s, cu.-s, s
7	o	o	ci.-s : 10, li.-cl, h	v, ci, ci.-cu : v, ci, ci.-cu, ci.-s
8	o : w	mN : o	7, cu, cu.-s : vv, ci, ci.-cu, ci.-s	6, ci.-s, ci, cu.-s : 4, ci.-s, ci.-cu
9	o : mN	wN : o : w	5, ci.-s, cu.-s : 10, cu.-s	9, ci.-cu, cu.-s, h: 9, ci.-cu,cu.-s,h: 8, ci, cu.-s, ci.-cu
10	o	o	3, ci, ci.-cu : v	7, ci, ci.-cu : o
11	m	o	10, ci, h	o, h : 10, ci, ci.-s :8,ci.-s,cu.-s,ci.-cu
12	o	o	8, ci.-cu, cu.-s, ci	5,ci.-cu,cu.-s,ci,h : 1, ci, ci.-cu : o
13	o	o	o	1, h, ci, ci.-cu : o : 4, li.-cl
14	o	o	o : o	o : 1, ci : 1, ci.-s, s
15	o	w : wN	2, ci, ci.-cu, ci.-s	2, ci, ci.-cu : 1, ci : 10,ci.-cu,cu.-s,ci
16	w	o	3, ci, ci.-s, ci.-cu	8, cu, ci.-cu, ci.-s : o, h
17	wN : wP	o	4, li.-cl, h	2, ci, ci.-s, n : o, h
18	wN : o	o : w	o	o : o, h
19	o	o	o	o, w : o, h
20	o	o	9, ci.-cu, cu.-s, ci.-s, r	10, ci.-s, h.-shs : 10, ci.-s,cu.-s :4,ci.-s,ci.-cu,ci, l
21	o	o	o	4, ci.-cu, cu : 9, cu.-s, h.-r
22	o	o	10, h.-r : 10, oc.-r	10, th.-r : 10 : o
23	o	ssN, ssP, g.-cur : o	5, ci, ci.-cu, ci.-s	7,cu,ci.-cu,cu.-s,h.-r: 9,ci.-cu,cu.-s, ci.-s : o
24	o	o	4, cu, ci.-cu, ci.-s, ci	10,cu,cu.-s,ci.-cu,sl.-r: 10, ci.-s, cu.-s : 10,ci.-s, ci.-cu, ci.-s
25	o	o	9, ci, ci.-s	10, ci.-s, cu.-s : o : o
26	o	o	o : 1, ci, ci.-cu	o : o
27	o	o	o, h : 7, li.-cl, h	2, li.-cl, h : 1, ci
28	o	o	6, ci, ci.-cu, h	6, ci, ci.-cu : 10
29	o	w : o	6, ci, ci.-s, ci.-cu	1, ci, ci.-cu : o : o
30	w	w : w	o, h : 2, ci.-cu	7, ci, ci.-s, ci.-cu : 9, cu.-s

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 65°·5 on the 20th ; and the lowest was 38°·4 on the 8th.

The mean „ was 51°·4, being 0°·6 *higher* than the average of the preceding 27 years.

Elastic Force of Vapour.—The mean for the month was $0^{in}\cdot379$, being $0^{in}\cdot006$ *greater* than the average of the preceding 27 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was $4^{grs}\cdot2$, being *the same* as the average of the preceding 27 years.

Degree of Humidity.—The mean for the month was 68 (that of Saturation being represented by 100), being 6 *less* than the average of the preceding 27 years.

Weight of a Cubic Foot of Air.—The mean for the month was 531 grains, being *the same* as the average of the preceding 27 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 4·4.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 1·0.

WIND.

The proportions were of N. 8, S. 7, W. 10, E. 4, and Calm 1. The greatest pressure in the month was $6^{lbs}\cdot5$ on the square foot on the 19th.

RAIN.

Fell on 5 days in the month, amounting to $0^{in}\cdot47$, as measured in the simple cylinder gauge partly sunk below the ground ; being $1^{in}\cdot51$ *less* than the average fall of the preceding 53 years.

ELECTRICITY.—The insulating lamp was not burning on June 3 and 4.

MONTH and DAY, 1868.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer, with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	General Direction. P.M.	Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs	lbs.	miles.	in.
July 1	..	30.102	73.6	53.4	59.6	50.8	157.7	50.3	65.4	64.4	8.8	20.6	2.4	− 1.3	N : NNE	N	1.8	0.0	0.4	302	0.00
2	..	29.974	77.8	54.7	64.7	53.6	153.2	48.6	66.4	64.8	11.1	23.0	1.2	+ 3.6	NNE	N	4.8	0.0	0.4	289	0.00
3	..	29.837	84.3	58.4	65.6	53.4	165.3	56.9	67.4	65.4	12.2	26.5	4.9	+ 4.3	NNE : N	N	2.6	0.0	0.6	330	0.00
4	Gr. Decn. S., Full.	29.841	67.8	51.0	56.2	47.6	129.0	44.0	67.1	65.4	8.6	17.6	2.0	− 5.3	N	N	5.0	0.0	0.5	328	0.00
5	..	29.844	73.4	48.2	59.4	48.4	130.5	39.4	66.9	65.4	11.0	21.9	1.0	− 2.3	NNW : NW	NW : WSW	0.9	0.0	0.0	174	0.00
6	..	29.893	73.2	52.5	62.1	50.5	133.1	49.1	66.4	65.4	11.6	22.4	4.2	+ 0.3	NNW : N	NNE : S	0.3	0.0	0.0	130	0.00
7	Apogee	29.961	76.8	51.6	64.6	52.2	131.2	46.5	65.4	64.9	12.4	24.3	3.0	+ 2.7	NW : N	N : SW	0.4	0.0	0.0	119	0.00
8	..	29.960	83.6	53.8	68.3	56.7	149.1	45.5	66.4	65.4	11.6	26.9	3.0	+ 6.6	SW	WSW : WNW	1.2	0.0	0.0	165	0.00
9	..	29.980	85.0	57.6	70.4	55.7	145.7	51.1	66.9	65.6	14.7	28.0	3.4	+ 8.7	NW : N	E	1.8	0.0	0.1	152	0.00
10	..	30.017	82.8	51.3	66.8	53.8	157.0	45.0	65.9	65.4	13.0	27.2	3.6	+ 5.0	N : NNE	ESE : E	3.2	0.0	0.2	226	0.00
11	In Equator	29.989	84.1	53.2	68.3	55.5	157.0	..	66.4	66.4	12.8	26.1	2.4	+ 6.5	NE	ENE : NE	2.5	0.0	0.3	289	0.13
12	..	29.905	80.1	56.9	66.0	59.3	118.5	55.1	67.4	66.4	6.7	18.0	2.5	+ 4.0	N : NNE	ENE : NE	2.6	0.0	0.3	263	0.48
13	Last Quarter	29.879	84.7	55.4	68.1	53.8	158.2	52.8	66.9	66.4	14.3	28.6	1.9	+ 5.8	NNE	NE	3.1	0.0	0.4	346	0.21
14	..	29.883	85.7	52.7	68.0	56.0	150.0	50.0	67.9	66.9	12.0	27.4	1.2	+ 5.5	NNE	NE : ESE	1.3	0.0	0.1	210	0.00
15	..	29.777	88.0	57.6	72.1	57.5	156.0	54.0	68.4	68.1	14.6	28.2	1.3	+ 9.6	NE	E : SE : SW	1.1	0.0	0.1	162	0.00
16	..	29.785	92.0	59.5	75.9	61.0	160.8	51.4	68.9	68.4	14.9	28.6	1.5	+13.5	SW	WSW : SW	0.5	0.0	0.0	152	0.00
17	..	29.857	84.0	63.6	72.6	58.8	127.3	60.0	69.9	69.7	13.8	23.1	2.7	+10.4	SW	WSW : N	1.0	0.0	0.1	196	0.00
18	Greatest Declination N.	29.853	87.8	61.8	72.5	58.3	161.7	57.0	70.4	69.4	14.2	27.0	7.5	+10.6	Calm : SE	SW	2.1	0.0	0.1	194	0.00
19	New	29.874	82.8	62.7	69.2	54.3	147.7	54.8	71.9	70.9	14.9	24.9	4.8	+ 7.6	WSW : WNW	NNW	0.7	0.0	0.1	233	0.00
20	Perigee.	29.896	90.0	52.4	72.0	51.6	159.2	46.1	70.4	70.4	20.4	36.7	3.4	+10.6	SW	SW	2.0	0.0	0.2	212	0.00
21	..	29.900	92.2	62.7	76.6	61.8	153.0	60.0	71.4	71.4	14.8	28.7	9.1	+15.1	SW	SW : SSW	0.5	0.0	0.0	134	0.00
22	..	29.801	96.6	62.4	77.9	56.9	168.0	56.3	71.9	71.3	21.0	38.4	2.2	+16.4	SE	S	0.7	0.0	0.0	138	0.01
23	..	30.003	79.7	54.0	63.3	54.8	134.7	49.0	72.2	71.9	8.5	18.7	5.0	+ 1.7	SW : N	N : NNE	12.0	0.0	1.1	361	0.00
24	In Equator.	30.239	73.1	50.9	61.6	46.7	147.0	45.0	68.4	68.4	14.9	24.4	7.4	− 0.1	NE	ENE	5.5	0.0	0.9	384	0.00
25	..	30.098	76.4	51.2	63.8	51.4	147.5	43.6	68.4	67.4	12.4	25.0	5.6	+ 2.0	NE	ENE	7.5	0.0	0.7	338	0.00
26	First Qr.	29.805	84.1	56.4	68.8	55.9	152.0	50.5	..	..	12.9	28.7	5.5	+ 6.9	NE : NNE	E : ENE : NW	0.5	0.0	0.0	177	0.01
27	..	29.698	89.3	59.3	74.0	58.2	149.7	57.8	69.4	68.4	15.8	30.6	2.5	+12.0	NW : WSW	W : SSW	0.7	0.0	0.0	163	0.00
28	..	29.548	90.1	61.1	74.4	58.7	167.0	58.5	69.4	69.4	15.7	28.2	3.0	+12.2	SSW : SW	SSW : SW	2.6	0.0	0.3	246	0.00
29	..	29.571	64.7	54.4	58.5	52.7	115.1	54.0	69.1	69.1	5.8	12.0	3.0	− 3.8	W : WSW	WSW	2.7	0.0	0.4	260	0.22
30	..	29.875	81.4	50.2	64.7	55.8	151.0	45.0	67.4	67.4	8.9	25.9	0.0	+ 2.3	WSW	WSW	2.5	0.0	0.2	234	0.00
31	Greatest Declination S.	29.998	78.0	55.8	66.2	49.6	143.5	50.0	68.4	67.9	16.6	28.1	9.5	+ 3.8	WSW : NW	N by W	1.6	0.0	0.3	264	0.00
																				Sum	Sum
Means	..	29.892	82.0	55.7	67.5	54.6	147.6	50.9	68.3	67.6	12.9	25.7	3.6	+ 5.6	...	...	..	..	..	7171	1.06

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first minimum in the month was 29in·811 on the 3rd.

The first maximum in the month was 30in·031 on the 11th; the second minimum ,, was 29in·850 on the 13th.
The second maximum ,, was 29in·926 on the 14th; the third minimum ,, was 29in·753 on the 15th.
The third maximum ,, was 29in·936 on the 20th; the fourth minimum ,, was 29in·781 on the 22nd.
The absolute maximum ,, was 30in·253 on the 24th; the absolute minimum ,, was 29in·509 on the 28th.
The range in the month was 0in·744.
The mean for the month was 29in·892, being 0in·093 *higher* than the average of the preceding 27 years.

TEMPERATURE OF THE AIR.

The highest in the month was 96°·6 on the 22nd; the lowest was 48°·2 on the 5th.
The range ,, was 48°·4.
The mean ,, of all the highest daily readings was 82°·0, being 8°·4 *higher* than the average of the preceding 27 years.
The mean ,, of all the lowest daily readings was 55°·7, being 2°·9 *higher* than the average of the preceding 27 years.
The mean daily range was 26°·3, being 5°·5 *greater* than the average of the preceding 27 years.
The mean for the month was 67°·5, being 5°·9 *higher* than the average of the preceding 27 years.

MONTH and DAY, 1868.	ELECTRICITY. A.M.	ELECTRICITY. P.M.	CLOUDS AND WEATHER. A.M.	CLOUDS AND WEATHER. P.M.
July 1	o : w	o : w	10, cu.-s, ci.-s, r	10, cu.-s, ci.-s : 3, cu, ci.-cu, ci : 1, ci.-s, ci
2	o	o	6, ci, ci.-cu	2, ci, ci.-cu, w : v, ci, ci.-s
3	o	o	10, ci.-s, cu.-s	3, ci, ci.-cu, ci.-s, cu, w : 8, ci, ci.-cu, ci.-s, cu.-s
4	o		10, ci, ci.-s, sl.-r : 10, oc.-r	10 : 4, ci, ci.-s
5			9, ci.-s, cu.-s, sl.-f	10, glm : 10
6			9, ci.-s, cu.-s, ci.-cu	10, cu.-s : 10, cu.-s
7			4, li.-cl, h	9, ci, ci.-s, ci.-cu, h : o, h
8			o, h : 3, ci, ci.-cu, h	6, cu, ci.-cu, ci.-s : 2, ci.-s, cu.-s
9			7, ci, ci.-s, ci.-cu, cu.-s, h	o : o
10			5, ci, ci.-cu, cu.-s, cu	o : 1, ci
11	o	o	5, ci, ci.-cu, ci.-s, h	4, ci, ci.-cu : 4, ci, ci.-cu, ci.-s : 10, t.-s, l, h.-r
12	o	s N :ssP,g.-cur	10, h.-r, t, l : 10 : 9, ci.-cu, ci.-s, t	8, ci.-cu, ci.-s, cu.-s, h.-shs : v, t.-s, l, c.-h.-r, w
13	o	o	10, h.-r, l, t : 5, ci, ci.-s	2, ci, ci.-s, w : o
14	o : w	o : ss P, sp	4, ci, ci.-s	6, ci, ci.-cu : 1, ci, h, l
15	w	ssN,sp,g.-cur; o	o : 1, cu	7, ci.-cu, ci, ci.-s, n, t, r : o, l
16	o	o	o : 1, ci, ci.-cu	6, ci, ci.-cu, cu : 4, ci, ci.-s, l
17	w	o	10, ci.-s, ci, ci.-cu	9, ci, ci.-s, ci.-cu : 3, ci, ci.-s, l
18	w	w N : o	10, ci, ci.-s	7, ci, ci.-s, ci.-cu : 9, ci.-s, cu.-s
19	o		v, ci.-s, ci.-cu, cu.-s, cu	v, ci.-s, cu.-s, ci.-cu : o
20			o	o : o : 2, ci
21			2, ci.-cu, h	4, ci.-cu, h : 2, s, h
22			5, ci, ci.-s, ci.-cu, cu	6, ci, ci.-cu, cu, ci.-s : 10, ci.-s, cu.-s, h.-shs
23			o, h : 5, cu.-s, w	10, cu.-s, w : 10, cu.-s, w
24			5, ci, ci.-cu, w	o, w : o
25			6, ci.-cu, ci.-s, w	o, w : o
26			8, ci, ci.-cu	8, ci, ci.-cu, shs.-r : 6, ci, ci.-s, cu.-s
27			o	2, ci, ci.-s, ci.-cu : o
28	o	o	o, h : 4, cu, ci.-cu	o : 10, s
29	o	o	10, h.-r : 10, cu.-s, ci.-s, ci.-cu, s, r	10, sc, cu.-s, r : 10
30	o	o	v, h : o, d, h	o, h : 2, ci, ci.-s, h
31	o	o : w	4, ci.-cu, ci.-s, cu.-s, h	1, ci.-cu, ci.-s : o o

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 63°·6 on the 16th and 21st; and the lowest was 44°·6 on the 4th.

The mean „ was 54°·6, being 1°·0 *higher* than the average of the preceding 27 years.

Elastic Force of Vapour.—The mean for the month was $0^{\text{in}}\cdot427$, being $0^{\text{in}}\cdot015$ *greater* than the average of the preceding 27 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was $4^{\text{grs}}\cdot7$, being $0^{\text{gr}}\cdot1$ *greater* than the average of the preceding 27 years.

Degree of Humidity.—The mean for the month was 63 (that of Saturation being represented by 100), being 13 *less* than the average of the preceding 27 years.

Weight of a Cubic Foot of Air.—The mean for the month was 524 grains, being 4 grains *less* than the average of the preceding 27 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 4·9.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 0·8.

WIND.

The proportions were of N. 12, S. 5, W. 8, E. 5, and Calm 1. The greatest pressure in the month was $12^{\text{lbs}}\cdot0$ on the square foot on the 23rd.

RAIN.

Fell on 6 days in the month, amounting to $1^{\text{in}}\cdot06$, as measured in the simple cylinder gauge partly sunk below the ground; being $1^{\text{in}}\cdot57$ *less* than the average fall of the preceding 53 years.

ELECTRICITY.—The insulating lamp was not burning from July 5 to 10 and 20 to 27.

MONTH and DAY, 1868.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer, with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	Osler's. General Direction. P.M.	Osler's. Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
Aug. 1	..	30.110	84.0	49.4	66.4	51.9	155.5	40.0	68.4	68.4	14.5	30.9	5.6	+ 4.0	N : SSW	SSW : SSE : Calm	0.5	0.0	0.0	113	0.00
2	..	29.994	84.0	52.8	68.9	55.9	154.2	45.0	68.4	68.4	13.0	26.6	2.2	+ 6.5	Calm : ESE	E : ENE	1.9	0.0	0.2	178	0.00
3	Full : Apogee.	29.884	81.5	60.4	70.3	60.1	158.1	53.8	69.4	68.4	10.2	20.2	3.6	+ 7.9	ENE	E	2.2	0.0	0.4	253	0.00
4	..	29.750	86.8	61.3	73.2	53.8	159.5	55.5	69.9	68.7	19.4	34.1	1.1	+10.9	E	ENE	3.0	0.0	0.3	221	0.00
5	..	29.683	90.5	60.7	74.2	58.6	162.0	55.0	69.4	69.4	15.6	28.8	2.2	+12.0	Calm : SW	S	1.3	0.0	0.1	138	0.00
6	..	29.579	78.9	62.9	67.6	63.3	137.5	57.0	70.9	69.4	4.3	13.3	0.2	+ 5.5	SSW	SSW	3.2	0.0	0.5	295	0.14
7	..	29.577	83.4	58.0	67.9	57.8	150.5	50.0	71.0	69.4	10.1	22.4	0.4	+ 5.9	SSW : SW	SW	11.0	0.0	1.0	388	0.06
8	In Equator	29.878	79.9	56.1	66.5	49.0	155.6	48.0	69.9	68.4	17.5	29.7	6.0	+ 4.5	SW	SW	9.2	0.0	0.9	354	0.00
9	..	29.968	79.7	53.4	64.8	52.9	104.5	53.0	69.4	68.4	11.9	25.8	1.6	+ 2.7	SSW	SW : Calm	0.5	0.0	0.1	139	0.00
10	..	29.745	82.7	57.5	69.5	58.3	157.5	56.8	68.5	68.4	11.2	20.4	3.2	+ 7.4	ENE	E	1.2	0.0	0.1	167	0.00
11	Last Qr.	29.421	73.1	58.0	65.5	59.3	108.0	52.0	68.4	67.4	6.2	14.6	1.3	+ 3.4	E : SSE	WSW : SSW	3.8	0.0	0.3	238	0.13
12	..	29.557	75.9	53.9	62.6	49.8	150.5	48.0	67.4	67.4	12.8	21.8	2.2	+ 0.6	SW	SSW : SE	2.4	0.0	0.3	257	0.00
13	..	29.375	69.2	54.7	60.1	56.5	84.0	46.2	66.4	65.4	3.6	13.3	1.4	− 1.8	SE : ESE	SE : SW : SSW	2.5	0.0	0.1	187	0.23
14	..	29.618	74.4	52.0	61.3	51.2	140.7	46.5	66.4	64.4	10.1	20.7	1.0	− 0.4	S	SSE : SE	1.8	0.0	0.2	207	0.01
15	Greatest Declination N.	29.724	79.1	54.9	66.5	53.6	155.5	47.1	67.4	65.4	12.9	25.3	0.4	+ 5.0	SE : S	SSE : ENE	1.5	0.0	0.2	168	0.00
16	..	29.643	71.0	60.2	65.6	61.9	89.4	53.4	67.5	65.4	3.7	6.7	0.9	+ 4.3	NE	E : NNE	1.5	0.0	0.1	210	0.23
17	Perigee	29.563	68.8	60.3	62.7	61.2	78.0	57.0	67.6	66.4	1.5	5.0	0.4	+ 1.6	N : NNE	N	2.6	0.0	0.2	231	0.76
18	New	29.448	74.8	59.0	63.7	60.1	99.3	55.6	67.4	64.4	3.6	13.3	0.6	+ 2.7	SE : ENE	SSE : SSW	0.6	0.0	0.0	137	0.04
19	..	29.630	70.4	60.0	63.2	59.1	89.5	60.0	66.4	64.4	4.1	9.4	1.1	+ 2.3	SE	SE : N	1.0	0.0	0.0	122	0.37
20	..	29.807	63.6	58.7	59.6	57.0	74.0	58.0	67.4	65.4	2.6	4.7	0.8	− 1.2	N by W	N by W : N	1.3	0.0	0.3	225	0.27
21	In Equator	29.797	73.2	54.5	61.8	54.3	125.2	51.8	66.9	65.4	7.5	14.3	0.6	+ 1.1	WSW	WSW	0.7	0.0	0.0	160	0.00
22	..	29.139	68.3	51.7	57.0	51.3	110.0	47.8	65.4	64.4	5.7	11.6	2.2	− 3.7	S	SW : WSW	30.0	0.0	3.6	576	0.31
23	..	29.452	67.5	51.9	57.4	46.8	117.0	48.2	65.4	63.9	10.6	17.1	5.2	− 3.2	WSW	W by S	30.0	0.3	2.9	615	0.00
24	..	29.691	68.3	49.0	57.5	47.7	120.0	44.0	61.9	59.4	9.8	19.4	2.7	− 3.0	WSW : W	WSW	2.5	0.0	0.7	357	0.00
25	First Qr.	29.911	70.4	49.3	58.4	47.3	135.0	41.3	62.4	60.9	11.1	21.9	1.9	− 2.1	WSW : W	W : WSW	1.9	0.0	0.2	282	0.00
26	..	29.977	69.8	47.8	57.7	50.4	119.5	42.4	61.9	60.4	7.3	18.1	2.3	− 2.6	SW : WSW	SSW	3.5	0.0	0.7	342	0.00
27	Greatest Declination S.	29.849	75.1	50.2	60.3	52.5	137.0	44.0	61.4	60.4	7.8	16.8	2.1	+ 0.2	SW	W	18.0	0.1	1.6	463	0.06
28	..	30.021	67.8	48.0	56.9	45.0	131.0	38.8	61.9	60.5	11.9	20.5	5.2	− 3.0	WSW : W	WNW : WSW	3.3	0.1	0.7	378	0.00
29	..	30.084	68.5	52.4	58.4	49.2	109.8	49.0	60.9	59.5	9.2	18.7	2.8	− 1.3	W : NW	NW : WSW	1.2	0.0	0.2	254	0.00
30	..	29.997	73.0	50.1	62.1	59.0	103.1	41.1	60.9	59.4	3.1	10.3	0.0	+ 2.7	WSW : W	W : WSW	0.7	0.0	0.1	243	0.00
31	Apogee	29.956	75.4	56.1	62.8	55.9	123.7	47.0	60.6	59.4	6.9	16.0	0.0	+ 3.6	WSW	WSW	2.2	0.0	0.2	254	0.00
Means	..	29.736	75.1	55.0	63.6	54.5	125.6	49.5	66.4	65.1	9.0	18.4	2.0	+ 2.3	...	...	..	..	..	Sum 8152	Sum 2.61

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The absolute maximum in the month was $30^{in}\cdot159$ on the 1st; the first minimum in the month was $29^{in}\cdot523$ on the 7th.
The second maximum ,, was $30^{in}\cdot010$ on the 9th; the second minimum ,, was $29^{in}\cdot400$ on the 11th.
The third maximum ,, was $29^{in}\cdot571$ on the 12th; the third minimum ,, was $29^{in}\cdot343$ on the 13th.
The fourth maximum ,, was $29^{in}\cdot765$ on the 15th; the fourth minimum ,, was $29^{in}\cdot433$ on the 18th.
The fifth maximum ,, was $29^{in}\cdot844$ on the 20th; the absolute minimum ,, was $29^{in}\cdot047$ on the 22nd.
The sixth maximum ,, was $30^{in}\cdot039$ on the 26th; the sixth minimum ,, was $29^{in}\cdot814$ on the 27th.
The seventh maximum ,, was $30^{in}\cdot096$ on the 29th; the seventh minimum ,, was $29^{in}\cdot937$ on the 31st.
The range in the month was $1^{in}\cdot112$.
The mean for the month was $29^{in}\cdot736$, being $0^{in}\cdot050$ *lower* than the average of the preceding 27 years.

TEMPERATURE OF THE AIR.

The highest in the month was $90^{\circ}\cdot5$ on the 5th; the lowest was $47^{\circ}\cdot8$ on the 26th.
The range ,, was $42^{\circ}\cdot7$.
The mean ,, of all the highest daily readings was $75^{\circ}\cdot1$, being $2^{\circ}\cdot4$ *higher* than the average of the preceding 27 years.
The mean ,, of all the lowest daily readings was $55^{\circ}\cdot0$, being $1^{\circ}\cdot9$ *higher* than the average of the preceding 27 years.
The mean daily range was $20^{\circ}\cdot1$, being $0^{\circ}\cdot5$ *greater* than the average of the preceding 27 years.
The mean for the month was $63^{\circ}\cdot6$, being $2^{\circ}\cdot4$ *higher* than the average of the preceding 27 years.

MONTH and DAY, 1868.	ELECTRICITY.		CLOUDS AND WEATHER.	
	A.M.	P.M.	A.M.	P.M.
Aug. 1	w	o : w	o	o : o
2	w	w	o	o : o
3	o	o	4, ci.-cu, ci, ci.-s, w	1, ci.-cu, ci, ci.-s, w : 9, ci, ci.-s
4	o	o	4, ci, ci.-cu	5, ci, ci.-cu : 4, ci, ci.-cu
5	o	o	o, h : 3, ci, ci.-s, ci.-cu	5, ci, ci.-cu, ci.-s : 6, ci, ci.-s
6	o	o	10 : 10, cu.-s, h.-r	10, cu.-s, ci.-cu : 10, cu.-s, w
7	o	o	10, h.-r : 10, cu.-s, th.-r	7, ci.-cu, cu, cu.-s, w : 1, cu.-s
8	o	o	9, ci, ci.-cu, ci.-s	5, ci, ci.-cu, ci.-s, w : 3, ci, ci.-cu, ci.-s, l
9			9, ci, ci.-cu, cu	9, cu, ci.-cu, ci.-s, cu.-s: 9, ci.-cu, ci.-s, l
10			4, ci.-cu, ci.-s	7, cu, cu.-s, ci.-cu, ci.-s: v
11			10 : 10, t, r	10 : 9, ci.-cu, ci.-s, h.-r
12			4, ci, ci.-cu	8, ci, ci.-cu : v, ci, ci.-s
13			10, h.-r	10, ci.-s, h.-r : 10, fr.-shs : o
14			10, r : ci.-cu, ci.-s, cu.-s, v	6, ci, ci.-cu, ci.-s : 10, s, cu.-s, ci.-s, sl.-r
15			4, cu, ci.-cu : 5, cu, ci.-cu, ci	4, ci.-cu, cu, ci. : 3, s, h, l
16			10, cu.-s, s, h.-r	10, fr.-shs, cu.-s, s : 10, cu.-s
17			10, th.-r : 10	10, r : 10, c.-h.-r, l
18			10 : 10, th.-r	5, ci.-cu, ci.-s, cu : 10, r : 10, h.-r
19			10, h.-r : 10, h.-r	10, ci.-cu, ci.-s, cu.-s, th.-r : 10, th.-cl
20			10, h.-r : 10, th.-r	10 : 10
21			5, ci.-s, h	7, ci.-cu, cu, cu.-s, ci.-s, h : o, h, l
22			10, r : vv, c.-h.-r, st.-w, sc	7, cu, ci.-cu, cu.-s, sc, h.-g: 10, th.-cl, sc, th.-r, h.-g
23			10, h.-g : 7, ci, ci.-cu, ci.-s, g	8, ci, ci.-cu, ci.-s, st.-w : v, ci, ci.-s, w
24			5, ci, ci.-cu, ci.-s	8, cu.-s, cu, ci.-cu: 6, ci : 1, ci.-s
25			1, ci.-s, h	6, ci, ci.-s, ci.-cu, h : v, ci, ci.-s
26			4, ci.-cu, ci, h	10, ci.-cu, ci.-s : 10, sl.-r, w
27			10, w : 10, r	4, ci, li.-cl : o
28			6, ci, ci.-cu, ci.-s, cu.-s, w	10, ci.-s : 10
29			8, ci.-s, ci.-cu, cu.-s	8, ci.-s, ci.-cu, cu.-s, h : o
30			7, ci.-s, cu.-s, h, th.-r	10, ci.-s, h : v, ci.-cu, ci.-s, cu.-s
31	o	o	10, ci.-s	9, cu, cu.-s, ci.-cu, ci, n: o

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 66°·1 on the 6th; and the lowest was 45°·1 on the 28th.

The mean ,, was 54°·5, being 0°·7 *higher* than the average of the preceding 27 years.

Elastic Force of Vapour.—The mean for the month was 0^{in}·425, being 0^{in}·007 *greater* than the average of the preceding 27 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was 4^{grs}·7, being 0^{gr}·1 *greater* than the average of the preceding 27 years.

Degree of Humidity.—The mean for the month was 73 (that of Saturation being represented by 100), being 4 *less* than the average of the preceding 27 years.

Weight of a Cubic Foot of Air.—The mean for the month was 526 grains, being 3 grains *less* than the average of the preceding 27 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 6·5.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 2·6.

WIND.

The proportions were of N. 3, S. 10, W. 11, E. 6, and Calm 1. The greatest pressure in the month was 30^{lbs}·0 on the square foot on the 22nd and 23rd.

RAIN.

Fell on 12 days in the month, amounting to 2^{in}·61, as measured in the simple cylinder gauge partly sunk below the ground; being 0^{in}·20 *greater* than the average fall of the preceding 53 years.

ELECTRICITY.—The insulating lamp was not burning from August 9 to 30.

MONTH and DAY, 1868.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	General Direction. P.M.	Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
Sept. 1	..	30·045	78·7	49·7	63·4	56·6	136·7	40·8	61·4	60·9	6·8	18·9	0·0	+ 4·4	WSW	W	1·2	0·0	0·2	239	0·00
2	Full	30·114	78·0	50·3	63·4	56·9	135·0	41·8	61·4	61·4	6·5	18·6	1·3	+ 4·7	WSW : Calm	SE : S	0·2	0·0	0·0	105	0·00
3	..	29·993	83·5	54·1	67·6	57·9	147·0	48·0	62·5	61·9	9·7	23·6	0·8	+ 9·2	Calm	SW : SSW	0·1	0·0	0·0	104	0·00
4	In Equator	29·975	85·2	53·1	69·4	58·7	150·6	49·5	63·4	61·4	10·7	25·1	0·4	+11·2	Calm : WSW	WSW : SW	0·2	0·0	0·0	138	0·00
5	..	30·063	82·5	54·9	68·1	59·9	139·2	49·1	63·7	61·6	8·2	19·7	0·8	+10·1	SW	Calm	0·1	0·0	0·0	106	0·00
6	..	30·004	86·5	54·4	69·4	59·1	116·2	49·0	64·4	63·4	10·3	26·7	0·0	+11·5	Calm	E : Calm	1·1	0·0	0·0	133	0·00
7	..	29·883	92·1	55·4	73·2	58·1	157·2	50·0	64·7	63·6	15·1	31·0	0·4	+15·4	Calm	SSW	1·7	0·0	0·1	100	0·00
8	..	30·038	69·6	56·3	62·0	56·6	106·0	50·0	..	..	5·4	10·3	1·1	+ 4·2	Calm : NNE	NNE : NE	4·2	0·0	0·6	301	0·00
9	Last Qr.	30·180	71·1	52·8	61·0	50·4	131·0	47·0	65·4	63·4	10·6	19·8	1·6	+ 3·3	NE : ENE	ENE	13·0	0·0	0·6	334	0·00
10	..	30·019	74·1	48·5	61·0	51·0	139·0	45·0	64·4	64·4	10·0	21·4	1·9	+ 3·3	NE : E	E : ESE	0·6	0·0	0·1	174	0·00
11	Greatest Declination N.	29·842	76·1	43·6	60·3	51·9	138·6	34·1	64·6	64·1	8·4	23·3	1·1	+ 2·7	Calm : NE	E : ESE : NE	0·8	0·0	0·1	181	0·00
12	..	29·836	74·2	54·2	61·1	50·0	142·8	44·0	65·6	60·4	11·1	21·8	1·0	+ 3·6	NE	NE	12·0	0·0	0·9	380	0·00
13	..	29·803	66·0	46·5	56·0	40·0	130·7	43·8	61·4	60·4	16·0	21·8	5·5	— 1·3	NE	ENE : NE	6·2	0·0	0·9	380	0·00
14	..	29·771	64·6	48·7	56·2	40·8	126·0	48·2	61·4	59·4	15·4	20·0	6·9	— 1·0	NE	NE	2·9	0·0	0·5	319	0·00
15	Perigee	29·810	64·5	51·7	56·9	47·1	107·7	51·0	60·4	58·4	9·8	15·5	5·2	— 0·2	NE	NE : ENE	1·1	0·0	0·1	217	0·00
16	New	29·762	69·3	48·0	57·6	47·4	142·0	47·3	59·5	59·4	10·2	18·5	4·8	+ 0·7	NE : E	ESE	0·3	0·0	0·1	168	0·00
17	In Equator	29·554	68·9	51·2	58·5	47·6	124·5	47·3	59·9	58·4	10·9	20·5	3·8	+ 1·8	E : ESE	E : ENE	12·5	0·0	0·6	290	0·00
18	..	29·402	66·5	50·5	57·9	53·4	111·0	46·0	58·9	58·4	4·5	9·7	0·0	+ 1·4	ENE : E	SSE : SE	2·4	0·0	0·1	173	0·27
19	..	29·367	64·3	48·2	56·5	54·5	111·0	45·0	58·7	58·4	2·0	6·8	0·0	+ 0·3	SE : E	E : S	0·8	0·0	0·1	167	0·00
20	..	29·499	68·0	56·1	60·5	53·8	103·8	51·0	59·4	59·4	6·7	11·5	2·5	+ 4·5	SSE : S	SSE : SE	1·3	0·0	0·2	209	0·02
21	..	29·554	74·4	47·1	59·1	54·4	135·4	40·6	59·7	58·4	4·7	16·6	0·0	+ 3·3	NE	E : NNE	1·2	0·0	0·1	166	0·00
22	..	29·540	69·5	53·0	60·3	50·1	133·0	45·1	60·4	59·4	10·2	18·0	2·0	+ 4·8	NNE	N : NNW	1·9	0·0	0·3	274	0·00
23	First Qr.	29·527	66·5	50·3	56·8	49·1	100·0	43·4	60·5	59·4	7·7	14·2	3·4	+ 1·6	W : NW	W : WSW	1·2	0·0	0·1	209	0·00
24	Greatest Declination S.	29·534	69·7	48·6	57·0	48·9	121·0	39·3	60·4	59·4	8·1	17·2	1·5	+ 2·0	WSW	WSW : SW	0·3	0·0	0·0	152	0·01
25	..	29·306	63·2	46·7	54·7	54·2	78·0	38·3	60·4	59·4	0·5	6·4	0·0	— 0·1	SE : E	SE : SW	14·5	0·0	0·8	330	0·43
26	..	29·531	69·0	51·0	60·2	53·0	121·0	49·5	59·4	58·9	7·2	16·4	0·0	+ 5·6	SSW	SSW : SSE	1·3	0·0	0·2	226	0·05
27	Apogee	29·268	64·1	55·4	59·5	50·3	99·0	54·8	59·9	58·8	9·2	12·1	3·7	+ 5·1	SSE : SSW	SSW	18·8	0·0	2·0	458	0·28
28	..	29·268	64·0	52·4	56·6	51·5	90·2	49·5	58·5	58·5	5·1	9·3	2·4	+ 2·4	SW : SSW	S : SSW	9·0	0·0	0·7	336	0·02
29	..	29·163	65·5	52·4	57·5	51·9	117·2	48·5	58·4	57·4	5·6	9·9	1·8	+ 3·4	SSW	SW	30·0	0·1	2·2	470	0·12
30	..	29·153	62·3	48·7	53·2	52·0	90·2	44·2	58·4	57·4	1·2	8·3	0·0	— 0·8	SW : SSW	SW : SSW	26·0	0·0	1·5	362	0·32
Means	..	29·693	71·7	51·1	60·5	52·2	122·7	46·0	61·3	60·2	8·3	17·1	1·8	+ 3·9	...	...	..	..	..	Sum 7201	Sum 1·52

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was 30in·152 on the 2nd; the first minimum in the month was 29in·964 on the 4th.
The second maximum ,, was 30in·073 on the 5th; the second minimum ,, was 29in·864 on the 7th.
The absolute maximum ,, was 30in·206 on the 9th; the third minimum ,, was 29in·334 on the 19th.
The fourth maximum ,, was 29in·584 on the 21st; the fourth minimum ,, was 29in·191 on the 25th.
The fifth maximum ,, was 29in·572 on the 26th; the fifth minimum ,, was 29in·240 on the 27th.
The sixth maximum ,, was 29in·340 on the 28th; the absolute minimum ,, was 29in·077 on the 30th.
The range in the month was 1in·129.
The mean for the month was 29in·693, being 0in·128 *lower* than the average of the preceding 27 years.

TEMPERATURE OF THE AIR.

The highest in the month was 92°·1 on the 7th; the lowest was 43°·6 on the 11th.
The range ,, was 48°·5.
The mean ,, of all the highest daily readings was 71°·7, being 4°·1 *higher* than the average of the preceding 27 years.
The mean ,, of all the lowest daily readings was 51°·1, being 2°·0 *higher* than the average of the preceding 27 years.
The mean daily range was 20°·6, being 2°·1 *greater* than the average of the preceding 27 years.
The mean for the month was 60°·5, being 3°·4 *higher* than the average of the preceding 27 years.

MONTH and DAY, 1868.	ELECTRICITY. A.M.	ELECTRICITY. P.M.	CLOUDS AND WEATHER. A.M.	CLOUDS AND WEATHER. P.M.
Sept. 1	o	o	o	3, ci.-cu, ci.-s, h : o, h
2	o	o	3, ci, ci.-s, h, d	2, ci.-cu, ci, h : o, h : o, d
3	o	o	f : 1, ci, sl.-f, d	o : 1, ci : 5
4	o	o	o, h	o : o
5	w	o	o, h, d	o, h : o, h
6	o	o	o	o : o
7	o	o	2, ci, ci.-cu, h	2, ci, ci.-cu : o
8	o	o	o : 10, ci.-s, w	10, ci.-s, cu.-s, w : 9
9	o	o	6, ci.-s, ci-cu, cu.-s, w	2, li.-cl, ci : o
10	o	o	o, h, d	o : o
11			3, ci, ci.-s	o : o : 10
12			9, ci.-s, w	7, ci, ci.-cu, ci.-s, w : 10
13			v, ci.-s, ci.-cu, w	8, ci.-cu, ci.-s : 9, ci.-cu, ci.-s
14			3, ci, ci.-s	10, ci.-s, cu.-s : 10
15			9, ci.-s, cu.-s	10 : 2 : 9
16			8, ci, ci.-s, cu.-s	8, ci.-cu, ci.-s, cu.-s : vv
17			10, ci.-s	7, ci, w : 9, ci, ci.-s : 10, ci.-s
18			7, ci, ci.-s, h : 10, t, l, h.-r	10, h.-r, t, l : 9, ci.-s, cu.-s : 10, c.-h.-r, t, l : 10, l
19			10, s, ci.-s, sl.-r	10, s : 10, th.-r
20			9, r : 9, ci.-s, cu.-s	9,ci.-cu,ci.-s,cu.-s,sl.-r : v, ci.-s : vv
21			o, f, h, cu.-s	5, cu,ci, ci.-cu, cu.-s: 2 : 10, th.-cl
22			6, ci, ci.-cu, ci.-s, cu.-s	3, ci, ci.-cu, cu, ci.-s, : o
23			o : 9, ci.-s, cu.-s	4, ci, ci.-cu, ci.-s : 10, th.-cl, l
24			10, sl.-r : 1, ci, d	2, ci, ci.-s, h : o, h, d, lu.-ha
25			10, r	10, c.-h.-r, st.-w : 9, ci.-s, cu.-s, oc.-r
26			7, ci, ci.-cu, ci.-s, sl.-r	vv, ci, ci.-cu, ci.-s : 10, cu.-s, ci.-s, l
27			r : 6,cu.-s,ci.-s,ci,ci.-cu,st.-w	10, ci.-s, sc, fr.-shs, st.-w : 6,ci.-s, ci.-cu, sc, h.-r, w
28			10, cu.-s, fr.-h.-shs	9, ci.-s, cu.-s : 6, ci, ci.-s, cu.-s, s, d, lu.-ha
29			w : 7, ci, ci.-s, ci.-cu, cu.-s, h.-r, sqs	6,ci.-cu,ci.-s,cu.-s,oc.-shs,fr.-h.-sqs: 6,cu.-s,ci.-s,s,fr.-shs,h.-sqs
30			fr.-h.-sqs, fr.-h.-shs : 10, sc, h.-r, h.-sqs	10, sc,fr.-shs,h,t,w : vv, cu : o, h

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 63°·2 on the 6th ; and the lowest was 39°·2 on the 13th.

The mean „ was 52°·2, being 1°·1 *higher* than the average of the preceding 27 years.

Elastic Force of Vapour.—The mean for the month was 0in·391, being 0in·010 *greater* than the average of the preceding 27 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was 4grs·4, being 0gr·2 *greater* than the average of the preceding 27 years.

Degree of Humidity.—The mean for the month was 74 (that of Saturation being represented by 100), being 7 *less* than the average of the preceding 27 years.

Weight of a Cubic Foot of Air.—The mean for the month was 528 grains, being 6 grains *less* than the average of the preceding 27 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 5·2.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 1·8.

WIND.

The proportions were of N. 5, S. 7, W. 5, E. 9, and Calm 4. The greatest pressure in the month was 30lbs·0 on the square foot on the 29th.

RAIN.

Fell on 9 days in the month, amounting to 1in·52, as measured in the simple cylinder gauge partly sunk below the ground ; being 0in·92 *less* than the average fall of the preceding 53 years.

ELECTRICITY.—September 11 to 30. Electrical apparatus being repaired.

MONTH and DAY, 1868.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	General Direction. P.M.	Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
Oct. 1	In Equator: Full.	29·614	59·9	48·6	52·8	48·5	82·2	41·1	57·9	56·4	4·3	7·5	1·3	− 1·1	NE : NNE	NE : NNE	14·2	0·0	0·6	305	0·00
2	..	29·929	61·4	42·9	50·9	44·2	123·2	35·7	57·6	56·4	6·7	16·3	0·0	− 2·9	NNE	NE	1·2	0·0	0·1	227	0·00
3	..	29·523	50·0	40·8	45·6	45·0	53·5	..	57·4	55·4	0·6	3·2	0·0	− 8·1	ENE : NE	NE : N : NW	6·2	0·0	0·5	317	0·43
4	..	29·686	60·2	39·3	50·2	46·7	111·0	39·0	55·4	54·9	3·5	9·7	0·0	− 3·3	WSW	WSW : SSW	2·3	0·0	0·2	235	0·04
5	..	29·906	64·0	47·8	55·0	50·2	111·0	46·5	55·1	54·7	4·8	12·2	1·7	+ 1·7	ENE : SE	S : SSW	0·5	0·0	0·0	118	0·00
6	..	29·854	60·3	48·7	54·9	52·2	78·5	41·7	..	..	2·7	8·7	0·0	+ 2·0	SSW	SSW	6·1	0·0	0·5	297	0·11
7	..	29·903	59·9	41·3	49·0	44·7	110·0	37·0	55·4	54·4	4·3	12·9	0·0	− 3·5	W	WSW	1·4	0·0	0·2	252	0·44
8	Greatest Declination N.	30·024	62·0	39·3	50·1	46·5	77·8	35·2	54·4	53·4	3·6	11·2	0·0	− 2·0	SW	WSW : SSW	1·9	0·0	0·2	239	0·00
9	Last Qr.	29·851	61·5	43·0	51·5	47·8	85·5	35·0	53·6	52·5	3·7	11·3	0·0	− 0·3	S by W	SSW : S by E	2·6	0·0	0·3	242	0·00
10	..	29·915	63·0	42·6	51·6	47·2	113·0	33·3	52·7	52·1	4·4	15·7	0·0	0·0	SE	E : ESE	0·5	0·0	0·0	128	0·00
11	..	29·975	62·7	35·4	49·0	45·8	110·0	30·1	..	..	3·2	9·3	0·0	− 2·4	Calm	E	0·4	0·0	0·0	98	0·00
12	..	29·920	66·6	41·0	53·2	48·0	108·7	34·7	..	..	5·2	13·9	0·0	+ 2·0	Calm	SSE	0·2	0·0	0·0	103	0·00
13	Perigee	29·940	58·4	44·7	51·1	51·1	59·6	38·7	..	..	0·0	1·9	0·0	+ 0·2	SW	Calm	0·1	0·0	0·0	70	0·00
14	In Equator	29·989	56·1	39·0	47·5	43·5	85·8	32·0	53·4	52·4	4·0	8·8	0·0	− 3·1	N	N	1·2	0·0	0·0	142	0·00
15	New	29·722	60·1	37·5	49·9	47·6	79·1	30·4	52·4	51·4	2·3	6·3	0·0	− 0·4	SW : SSW	SW	6·6	0·0	0·7	297	0·01
16	..	29·497	60·0	43·6	49·7	45·1	99·6	35·5	53·0	51·6	4·6	12·7	0·0	− 0·3	SW	WSW	4·1	0·0	0·6	357	0·02
17	..	29·500	57·3	39·6	47·2	41·7	106·5	31·2	52·4	50·9	5·5	12·4	0·0	− 2·6	WSW	WSW : Calm	1·7	0·0	0·4	258	0·00
18	..	29·504	47·7	37·8	42·6	36·5	67·0	31·6	51·4	49·4	6·1	9·5	3·6	− 7·0	Calm : N	N : NNW	1·3	0·0	0·2	199	0·00
19	..	29·624	46·7	30·0	38·2	33·8	72·3	20·5	50·4	47·4	4·4	12·4	0·0	−11·1	WSW	W : N	1·0	0·0	0·1	175	0·01
20	..	29·772	47·7	29·3	37·0	36·2	74·8	20·5	50·4	47·9	0·8	5·1	0·0	−12·1	NNW : WSW	W : S	0·2	0·0	0·0	179	0·00
21	Greatest Declination S.	29·613	52·2	37·0	43·6	40·2	86·8	32·5	49·6	46·4	3·4	9·8	0·0	− 5·3	SW	W by N : WSW	1·9	0·0	0·2	271	0·16
22	..	29·860	54·3	34·5	43·3	41·3	69·6	25·8	48·7	46·4	2·0	7·6	0·0	− 5·4	WSW	W : SW	0·7	0·0	0·1	221	0·00
23	First Qr.	29·639	53·5	39·6	45·7	43·1	66·3	29·6	49·4	47·4	2·6	9·6	0·0	− 2·8	SSW	NW : WSW	4·2	0·0	0·6	353	0·15
24	..	29·387	59·6	39·0	47·5	47·3	59·6	31·0	48·7	46·6	0·2	4·8	0·0	− 0·7	WSW : SW	SSW : WSW : WNW	28·0	0·0	2·3	519	0·17
25	Apogee	29·603	55·9	44·9	51·2	50·4	62·0	36·2	49·3	46·4	0·8	3·8	0·0	+ 3·3	WSW	WSW	2·2	0·0	0·3	272	0·21
26	..	29·766	54·8	39·6	46·6	42·7	82·2	34·0	49·4	46·7	3·9	11·2	0·0	− 1·0	N : WNW	W	1·8	0·0	0·3	290	0·44
27	..	30·034	49·9	36·7	42·1	37·3	74·2	28·5	48·4	46·8	4·8	11·5	0·0	− 5·2	W : NW	WNW : WSW	1·8	0·0	0·3	304	0·00
28	..	30·151	51·8	34·8	43·6	41·8	72·4	26·8	47·4	45·4	1·8	7·4	0·0	− 3·4	WSW	WSW : SW	2·9	0·0	0·3	267	0·00
29	In Equator	29·725	52·7	40·0	45·3	39·1	89·5	34·0	45·9	44·4	6·2	12·2	0·0	− 1·5	SW : W	W : WSW	19·0	0·1	2·3	545	0·40
30	..	30·072	53·0	39·0	46·1	41·9	77·6	31·9	46·1	44·4	4·2	8·8	0·0	− 0·5	W by S	W : WSW	2·9	0·0	0·6	385	0·00
31	Full	30·088	59·3	46·4	52·5	48·2	93·6	41·0	46·9	46·0	4·3	8·7	1·5	+ 6·0	WSW	WSW	5·8	0·0	1·2	459	0·00
Means	..	29·793	56·8	40·1	47·9	44·4	85·3	33·4	51·6	49·9	3·5	9·6	0·3	− 2·3	...	...	..	..	..	Sum 8124	Sum 2·59

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first maximum in the month was 29in·947 on the 2nd; the first minimum in the month was 29in·377 on the 3rd.
The second maximum ,, was 29in·957 on the 5th; the second minimum ,, was 29in·780 on the 6th.
The third maximum ,, was 30in·048 on the 8th; the third minimum ,, was 29in·832 on the 9th.
The fourth maximum ,, was 30in·001 on the 11th; the fourth minimum ,, was 29in·898 on the 12th.
The fifth maximum ,, was 30in·005 on the 14th; the fifth minimum ,, was 29in·433 on the 16th.
The sixth maximum ,, was 29in·544 on the 17th; the sixth minimum ,, was 29in·495 on the 18th.
The seventh maximum ,, was 29in·816 on the 20th; the seventh minimum ,, was 29in·558 on the 21st.
The eighth maximum ,, was 29in·883 on the 22nd; the absolute minimum ,, was 29in·203 on the 24th.
The ninth maximum ,, was 29in·647 on the 25th; the ninth minimum ,, was 29in·571 on the 25th.
The absolute maximum ,, was 30in·241 on the 28th; the tenth minimum ,, was 29in·627 on the 29th.
The eleventh maximum ,, was 30in·123 on the 31st.
The range in the month was 1in·038.
The mean for the month was 29in·793, being 0in·096 *higher* than the average of the preceding 27 years.

TEMPERATURE OF THE AIR.

The highest in the month was 66°·6 on the 12th; the lowest was 29°·3 on the 20th.
The range ,, was 37°·3.
The mean ,, of all the highest daily readings was 56°·8, being 1°·9 *lower* than the average of the preceding 27 years.
The mean ,, of all the lowest daily readings was 40°·1, being 4°·0 *lower* than the average of the preceding 27 years.
The mean daily range was 16°·7, being 2°·1 *greater* than the average of the preceding 27 years.
The mean for the month was 47°·9, being 2°·6 *lower* than the average of the preceding 27 years.

MONTH and DAY, 1868.	ELECTRICITY A.M.	ELECTRICITY P.M.	CLOUDS AND WEATHER. A.M.	CLOUDS AND WEATHER. P.M.
Oct. 1			9, ci.-cu, ci.-s, cu, cu.-s, d	10, cu.-s : 6, ci, s
2			4, ci, d, h	6, ci, ci.-s, ci.-cu : 3, ci
3			10, ci.-s, h.-r	10, h.-r : 10, h.-r, w
4			sl.-r, w : 0, sl.-f	1, ci.-cu, h : 10, ci.-cu, cu.-s
5		o	10, ci.-s, sl.-r	9, ci.-s, cu.-s, ci, ci.-cu : 7, ci, ci.-s, ci.-cu, d
6	o	o	10, ci.-s, oc.-r	10, ci.-s, oc.-r : 10, ci.-s, cu.-s, h.-r, w
7	o	o	10, c.-h.-r : 1, ci, ci.-cu	6, ci, ci.-cu, cu : 0, d
8	o	o	0, d : 0, d	7, ci, ci.-s, ci.-cu, cu.-s : 7, ci.-s, ci, ci.-cu
9	o	o	10, ci.-s, cu.-s	6,ci,ci.-s,cu.-s,cu,ci.-cu: o : o
10	o	o : w	4, ci, ci-cu, sl.-f, d	6, ci, ci.-cu, ci.-s : 0, d, sl.-f
11	o : m	m	0, f, d	1, ci, ci.-cu : 0, f
12	o	o	0, f : 1, ci	1, ci.-cu, ci.-s : 2, ci.-cu
13	o	o	10, f	10, cu.-s, ci.-cu, ci.-s, f : 0, f, sl.-r
14	o	o : w	7, ci.-s, ci, ci.-cu, h, d, so.-ha	3, ci, ci.-s, cu.-s, h : o
15	o	o	10, oc.-r	10, ci.-cu, ci.-s, sl.-r, w : o
16	w	w	10, ci.-s, cu.-s : 9, ci.-cu, ci, ci.-s	3, ci, ci.-s, ci.-cu, r : 0, d, ms
17	o	o : w	9, ci, ci.-s, ci.-cu, d, r	5, ci, cu, ci.-cu : 0, h, f, d
18			9, ci, ci.-cu, ci.-s, h	10, ci.-s : 10
19			0, f, h.-fr, h : 3, ci.-s, ci.-cu, cu.-s, h	10, ci.-cu, ci.-s, cu.-s, h : 10, r
20	o	o	10, th.-cl, h, h.-fr : 5, h	4, ci.-cu, cu.-s, h : 0, d
21	o	o : w	10, h.-r : 10, h.-r : 2, ci.-cu	6, ci, ci.-s, cu.-s, r : o
22	o	o : w	0, h, h.-fr : 4, ci, cu, cu.-s, ci.-s	7, cu, cu.-s, ci.-cu, h : 1, ci.-s
23	o	o : w	10, r, w	9, ci.-cu, cu.-s, ci.-s, v : 10, ci.-s, cu.-s
24	o		10, ci.-s : 10, ci.-s, r, w	10, r, sc, st.-w : 0, st.-w
25			10, cu.-s, ci.-s, ci.-cu, r	10, c.-r : 10, c.-r
26			10, c.-r : 4, ci, ci.-s, ci.-cu	7, ci, ci.-s, ci.-cu, cu.-s : o
27	o	o : w	0, h, d : 2, ci.-cu	5, ci.-cu, ci.-s, h : 0, h
28	o	o : w	0, h, h.-fr : 0, h	10, ci.-s, s, so.-ha : 10, th.-cl, r
29	o	o	10, h.-r, st.-w : 10, r, st.-w	vv, ci.-s, ci.-cu, w : 1, ci.-cu : 4, ci, ci.-s, d, lu.-co
30			10, ci.-s, s : 2, ci.-cu	6, ci.-cu, ci.-s, s, cu, h : 10, ci.-s, s : 10, ci.-s : 0, lu.-co
31			10, w : 8, ci.-cu, ci, cu.-s, cu, w	9, ci.-cu, ci.-s, w : vv, sc, lu.-co, lu.-ha, w

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 55°·8 on the 25th; and the lowest was 30°·3 on the 19th.

The mean ,, was 44°·4, being 2°·0 *lower* than the average of the preceding 27 years.

Elastic Force of Vapour.—The mean for the month was 0in·293, being 0in·024 *less* than the average of the preceding 27 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was 3grs·3, being 0gr·4 *less* than the average of the preceding 27 years.

Degree of Humidity.—The mean for the month was 88 (that of Saturation being represented by 100), being 1 *greater* than the average of the preceding 27 years.

Weight of a Cubic Foot of Air.—The mean for the month was 543 grains, being 4 grains *greater* than the average of the preceding 27 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 5·8.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 1·1.

WIND.

The proportions were of N. 4, S. 8, W. 13, E. 3, and Calm 3. The greatest pressure in the month was 28lbs·0 on the square foot on the 24th.

RAIN.

Fell on 13 days in the month, amounting to 2in·59, as measured in the simple cylinder gauge partly sunk below the ground; being 0in·20 *less* than the average fall of the preceding 53 years.

ELECTRICITY.—October 1 to 4. Electrical apparatus being repaired; insulating lamp not burning on October 18, 19, 25, 26, 30, and 31.

MONTH and DAY, 1868.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer, with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	General Direction. P.M.	Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
Nov. 1	..	30.032	57.1	52.3	54.5	50.6	61.5	47.5	48.4	45.4	3.9	5.2	2.0	+ 8.1	SW	SW	5.4	0.2	1.7	505	0.00
2	..	30.015	55.1	39.4	47.4	44.9	63.3	35.0	48.5	44.4	2.5	5.8	0.0	+ 1.1	SW : N : W	W : WSW	6.4	0.0	0.5	311	0.03
3	..	29.718	53.2	42.0	49.0	43.8	65.3	36.0	48.4	45.4	5.2	8.8	2.8	+ 2.9	SW	WSW	(30.0)	0.2	4.6	743	0.00
4	Greatest Declination N.	29.495	53.9	44.7	49.8	46.4	59.0	40.0	49.4	46.4	3.4	5.4	1.0	+ 3.9	WSW	WSW	(30.0)	0.5	3.6	703	0.15
5	..	29.578	46.7	30.4	38.4	32.4	78.7	22.5	48.4	45.4	6.0	12.6	1.3	− 7.3	W	WNW : WSW	10.8	0.0	0.8	406	0.00
6	..	29.647	42.9	26.1	33.5	27.4	72.4	18.2	46.4	44.4	6.1	11.0	0.0	−12.0	WSW : N	N	1.7	0.0	0.2	228	0.00
7	Last Qr.	29.770	43.1	27.2	34.5	28.4	74.2	18.6	45.4	43.4	6.1	11.4	2.0	−10.8	N	N : NNW	4.0	0.0	0.6	304	0.00
8	..	29.780	43.7	28.4	36.3	32.0	78.0	18.0	44.4	43.4	4.3	10.8	0.0	− 8.7	WSW : N	N	1.6	0.0	0.2	243	0.03
9	Perigee.	29.898	46.3	29.5	38.5	34.7	78.0	28.5	44.1	43.4	3.8	10.6	0.0	− 6.2	WNW : N : NNE	NNE	5.3	0.0	0.4	298	0.02
10	..	29.877	46.9	33.4	39.6	34.6	83.0	27.7	43.9	41.4	5.0	10.7	0.0	− 4.8	NNE	NNE	2.1	0.0	0.3	277	0.00
11	In Equator	30.040	47.4	37.9	42.4	40.4	56.4	28.3	43.4	..	2.0	5.5	0.7	− 1.7	N : NE	NE	0.7	0.0	0.1	166	0.01
12	..	30.315	46.4	40.4	43.2	35.4	58.0	39.0	42.9	..	7.8	10.1	5.5	− 0.6	NE	ENE	1.1	0.0	0.1	198	0.00
13	..	30.404	45.4	40.9	42.7	38.4	50.0	32.5	43.4	41.4	4.3	6.4	3.0	− 0.8	NE : NNE	N	0.8	0.0	0.1	192	0.00
14	New	30.062	46.2	38.0	42.4	39.8	54.2	30.5	42.9	41.4	2.6	4.8	1.3	− 0.8	N	N : NNE	1.5	0.0	0.3	253	0.00
15	..	30.133	44.8	31.7	37.8	32.4	65.0	30.0	42.4	41.4	5.4	9.5	1.4	− 5.1	NNE : NE	ENE	12.0	0.0	0.7	349	0.00
16	..	30.069	43.3	30.9	38.1	37.0	54.0	23.5	42.4	40.9	1.1	3.7	0.0	− 4.5	Calm : NNE	NNE	0.2	0.0	0.0	128	0.00
17	..	30.115	45.6	39.6	42.7	40.7	50.3	36.7	42.3	41.4	2.0	3.6	0.9	+ 0.4	NNE	NE	0.6	0.0	0.1	186	0.01
18	Greatest Declination S.	30.170	46.0	41.1	43.1	40.2	51.4	39.0	41.9	41.3	2.9	4.4	1.5	+ 1.1	NE	NE	0.7	0.0	0.1	162	0.00
19	..	30.192	46.6	37.1	41.4	33.2	64.2	32.2	42.4	41.4	8.2	11.7	2.6	− 0.4	NE	ENE	3.5	0.0	0.1	224	0.03
20	..	30.059	43.4	29.0	35.2	24.3	76.1	23.0	42.3	41.1	10.9	15.6	5.5	− 6.4	Calm	SE	2.6	0.0	0.1	176	0.00
21	..	29.604	49.4	29.7	40.2	38.4	49.4	22.5	41.4	40.4	1.8	4.6	0.0	− 1.2	Calm : SSE	S : SSW	5.5	0.0	0.4	292	0.00
22	Apogee First Quarter.	29.024	53.0	43.2	49.6	48.5	55.0	40.0	42.0	41.4	1.1	2.2	0.0	+ 8.4	SSW	SSW	30.0	0.5	3.8	652	0.66
23	..	29.197	53.0	39.0	45.5	43.8	54.0	34.0	43.1	40.4	1.7	4.4	0.0	+ 4.4	SSW : WSW : NW	WSW : SW	4.3	0.0	0.6	322	0.13
24	..	29.690	43.7	34.2	38.5	35.8	56.0	29.1	43.7	42.4	2.7	4.6	0.0	− 2.5	SW	W : SW	0.6	0.0	0.0	198	0.00
25	In Equator.	29.471	46.3	32.0	40.7	38.3	53.0	28.0	43.9	42.4	2.4	6.8	0.0	− 0.2	SSE	SE	1.9	0.0	0.2	225	0.01
26	..	29.621	48.7	38.3	43.4	42.4	70.5	37.5	44.4	42.4	1.0	4.2	0.0	+ 2.5	E : ENE : NE	N : NNE	0.4	0.0	0.0	187	0.06
27	..	29.816	42.3	39.3	40.6	37.8	43.0	31.6	43.4	42.4	2.8	3.9	1.6	− 0.5	N	NNE	0.3	0.0	0.0	168	0.00
28	..	29.791	41.7	37.8	39.4	35.9	46.7	36.6	43.4	42.1	3.5	4.2	2.3	− 1.9	NNE	N : Calm	0.1	0.0	0.0	101	0.02
29	..	29.828	43.1	30.9	35.6	32.9	49.0	30.5	43.4	42.1	2.7	8.6	0.0	− 6.0	Calm	SE : SSE	1.3	0.0	0.1	137	0.00
30	Full	29.661	42.8	38.6	40.6	36.5	54.0	37.9	43.1	41.9	4.1	5.1	2.5	− 1.3	SSE	SSE	2.1	0.0	0.6	306	0.00
Means	..	29.836	46.9	36.1	41.5	37.6	60.8	31.1	44.2	42.5	3.9	7.2	1.3	− 1.7	...	...	..	..	..	Sum 8640	Sum 1.16

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The absolute maximum in the month was 30in·463 on the 13th; the first minimum in the month was 29in·443 on the 4th.
The second maximum ,, was 30in·176 on the 15th; the second minimum ,, was 30in·025 on the 14th.
The third maximum ,, was 30in·195 on the 18th; the third minimum ,, was 30in·037 on the 16th.
The fourth maximum ,, was 30in·206 on the 19th; the fourth minimum ,, was 30in·151 on the 18th.
The fifth maximum ,, was 29in·714 on the 24th; the absolute minimum ,, was 28in·936 on the 22nd.
The sixth maximum ,, was 29in·831 on the 27th; the sixth minimum ,, was 29in·438 on the 25th.
The seventh maximum ,, was 29in·864 on the 29th; the seventh minimum ,, was 29in·778 on the 28th.
The range in the month was 1in·527.
The mean for the month was 29in·836, being 0in·073 *higher* than the average of the preceding 27 years.

TEMPERATURE OF THE AIR.

The highest in the month was 57°·1 on the 1st; the lowest was 26°·1 on the 6th.
The range ,, was 31°·0.
The mean ,, of all the highest daily readings was 46°·9, being 2°·3 *lower* than the average of the preceding 27 years.
The mean ,, of all the lowest daily readings was 36°·1, being 1°·3 *lower* than the average of the preceding 27 years.
The mean daily range was 10°·8, being 1°·0 *less* than the average of the preceding 27 years.
The mean for the month was 41°·5, being 2°·5 *lower* than the average of the preceding 27 years.

MONTH and DAY, 1868.	ELECTRICITY. A.M.	ELECTRICITY. P.M.	CLOUDS AND WEATHER. A.M.	CLOUDS AND WEATHER. P.M.
Nov. 1			10, w	10, w : 10, w
2			10, w : 10, ci.-s, h.-sqs, r	10, ci.-s, ci.-cu, h : 0
3			10, st.-w	10, ci.-s, g : 10, ci.-s, cu.-s, g
4			10, g : 10, sc, g	10, sc, th.-r, w : 10, h.-r, w : 7,ci.-cu,ci.-s,w
5			0, mt, h	v, ci.-cu, cu, h : 0, h, f, h.-fr
6			0, h, h.-fr, sl.-f	6, ci.-cu, ci.-s, cu.-s, h : 0, h.-fr
7			h, h.-fr : v, th.-r	0 : 0, h.-fr
8			sn, h : 0, h	1, ci.-cu : v, cu, ci.-cu : 0, h.-fr
9			10, ci.-s, th.-r : 5, ci, ci.-cu, ci.-s	10, th.-cl, oc.-shs : v, th.-cl
10			6, ci, ci.-cu, ci.-s, sl.-f, h	v, ci.-s : 10, cu.-s : 10, cu.-s, th.-r
11			10, ci.-s, th.-r	10, ci.-s : 10, th.-cl
12			10 : 10, cu.-s, sl.-r	v, ci.-s, cu.-s, ci.-cu : 10
13			10, ci.-s : 10, ci.-s	10, ci.-s, th.-r : 10, th.-cl, sl.-r
14			v : 10	10, ci.-s, th.-r : v, cu.-s, ci.-s, th.-r
15			9, ci.-s, ci.-cu, cu.-s, w	10, ci.-s, cu.-s, cu : v, th.-cl, h.-fr
16			10 : 10	vv, ci.-s, cu.-s, ci.-cu, ci : v
17			10, th.-cl, ci.-s, cu.-s, h, th.-r	10, ci.-s, th.-r : 10
18			10 : 10, th.-r	10, ci.-s, oc.-th.-r : 10
19			10, ci.-s, r : 10, ci.-s	10, th.-cl, ci.-cu, ci.-s : 10
20			sl.-f, h, h.-fr : 0	4, ci, h : 2, ci.-s, lu.-co, h.-fr, h
21			10, cu.-s, ci.-s : 10, ci.-s	10, ci.-s, th.-r : 10, ci.-s, oc.-th.-r, w
22			10, sc, r, st.-w : 10, sc, g	10, sc, g, r : 10, h.-g, r
23			10, w, h.-r : 10, ci.-s, th.-r	10,ci.-cu,ci.-s,cu.-s,h,f: v, ci.-cu : 0
24			8, ci.-s, ci.-cu, f	5, h, glm : 10, glm : 0, h.-fr
25			10, ci.-s	10 : 10, th.-r
26			9, ci.-cu, ci.-s	10, ci.-s, r, glm : 7, ci.-s, cu.-s, r
27			10 : 10	10 : 10, cu.-s, th.-r
28		0	10 : 10	10, cu.-s, r : 10, cu.-s
29	0	0	1, th.-f, h.-fr	0, th.-f : 10, ci.-s, sl.-f
30	0	0	10 : 10, cu.-s	9, ci, ci.-cu, ci.-s, cu.-s, r : 10, th.-cl

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was 52°·3 on the 1st; and the lowest was 20°·9 on the 20th.

The mean ,, was 37°·6, being 2°·2 *lower* than the average of the preceding 27 years.

Elastic Force of Vapour.—The mean for the month was $0^{in}\cdot225$, being $0^{in}\cdot026$ *less* than the average of the preceding 27 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was $2^{grs}\cdot6$, being $0^{gr}\cdot2$ *less* than the average of the preceding 27 years.

Degree of Humidity.—The mean for the month was 87 (that of Saturation being represented by 100), being 1 *less* than the average of the preceding 27 years.

Weight of a Cubic Foot of Air.—The mean for the month was 552 grains, being 4 grains *less* than the average of the preceding 27 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 7·8.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 1·4.

WIND.

The proportions were of N. 11, S. 6, W. 6, E. 5, and Calm 2. The greatest pressure in the month was $30^{lbs}\cdot0$ on the square foot on the 3rd, 4th, and 22nd.

RAIN.

Fell on 12 days in the month, amounting to $1^{in}\cdot16$, as measured in the simple cylinder gauge partly sunk below the ground; being $1^{in}\cdot22$ *less* than the average fall of the preceding 53 years.

ELECTRICITY.—The insulating lamp was not burning from November 1 to 27.

MONTH and DAY, 1868.	Phases of the Moon.	Mean Daily Reading of the Barometer (corrected and reduced to 32° Fahrenheit).	Readings of Thermometers. Dry. Highest.	Dry. Lowest.	Dry. Mean Daily Value.	Dew Point. Mean Daily Value.	Highest in the Sun, as shown by a Self-Registering Thermometer, with blackened bulb in vacuo, placed on the Grass.	Lowest on the Grass, as shown by a Self-Registering Minimum Thermometer.	In the Water of the Thames, at Greenwich, by Self-Registering Thermometers, read at 9h A.M. Highest.	In the Water of the Thames. Lowest.	Difference between the Dew Point Temperature and Air Temperature. Mean Daily Value.	Difference. Greatest.	Difference. Least.	Difference between the Mean Temperature of the Day and the Mean Temperature of the same Day on an Average of 50 Years.	Wind as deduced from Anemometers. Osler's. General Direction. A.M.	General Direction. P.M.	Pressure in lbs. on the square foot. Greatest.	Pressure. Least.	Pressure. Mean of 24 Obs.	Robinson's. Amount of Horizontal Movement of the Air on each Day.	Rain in Inches, collected in a Gauge whose receiving surface is 5 inches above the Ground.
		in.	°	°	°	°	°	°	°	°	°	°	°	°			lbs.	lbs.	lbs.	miles.	in.
Dec. 1	..	29·616	44·9	39·6	42·1	40·1	52·0	37·5	42·9	41·5	2·0	3·1	0·2	0·0	SSE	Calm	1·2	0·0	0·1	128	0·05
2	Greatest Declination N.	29·605	49·7	42·0	46·4	45·6	54·8	41·0	43·4	41·4	0·8	2·9	0·0	+ 4·2	Calm	S : SSE	0·2	0·0	0·0	93	0·00
3	..	29·441	51·9	44·1	48·9	47·2	62·5	43·0	43·4	42·4	1·7	2·8	1·0	+ 6·6	SSE : SSW	SW	3·1	0·0	0·5	300	0·07
4	Perigee.	29·381	55·0	45·0	51·6	49·6	62·3	44·0	43·9	42·6	2·0	5·8	0·0	+ 9·4	SW	SSW	27·0	0·1	2·1	585	0·16
5	..	29·288	57·4	51·3	53·7	50·2	57·4	47·0	44·6	43·1	3·5	7·8	0·0	+11·5	SW	SW : WSW	30·0	0·0	2·9	637	0·03
6	Last Qr.	29·392	57·8	49·5	53·9	52·0	57·8	44·7	44·9	43·5	1·9	3·2	1·0	+11·8	SW	SW	30 +	0·0	3·2	606	0·34
7	..	29·659	53·0	46·7	49·4	45·7	57·4	43·4	46·4	44·4	3·7	6·4	0·0	+ 7·4	WNW : WSW	SW : SSW : SE	30 +	0·0	1·6	475	0·45
8	In Equator.	29·340	54·0	47·1	50·9	47·1	62·5	44·6	47·9	45·7	3·8	6·8	0·0	+ 9·2	SW	SW : NNE	12·5	0·0	1·6	457	0·50
9	..	30·098	50·2	38·6	42·6	37·9	58·7	38·2	47·4	45·4	4·7	6·8	1·8	+ 1·3	N	E : SE	1·2	0·0	0·2	203	0·00
10	..	29·706	51·9	41·0	48·3	43·3	63·9	37·0	45·4	43·4	5·0	10·0	0·0	+ 7·3	S : SSW	SSW	30·0	0·0	2·4	475	0·00
11	..	29·139	55·0	41·6	49·9	48·3	57·6	38·0	45·4	42·9	1·6	6·4	0·0	+ 9·2	SSW	SW : WSW : N	30·0	0·2	2·8	575	0·01
12	..	29·777	43·7	32·7	38·5	34·1	50·5	28·5	46·9	44·6	4·4	8·0	0·0	− 2·1	NNE	ESE	3·7	0·0	0·2	209	0·00
13	..	29·510	49·4	39·0	44·9	44·1	63·0	36·0	46·5	44·6	0·8	2·9	0·0	+ 4·4	E	SE	2·1	0·0	0·2	216	0·02
14	New	29·349	52·8	46·1	50·3	46·8	61·0	41·7	46·4	44·4	3·5	7·0	0·8	+ 9·9	SSW : S	S : SSW	16·0	0·3	3·1	553	0·13
15	Greatest Declination S.	29·323	54·8	49·0	51·4	47·4	60·1	44·0	47·4	45·4	4·0	6·2	1·2	+11·2	SW	SSW : SE : SW	15·9	0·0	1·7	446	0·36
16	..	29·357	51·0	44·1	47·1	42·0	53·7	40·3	46·4	44·4	5·1	6·3	2·5	+ 7·1	SW	WSW : SW	19·2	0·1	2·1	552	0·10
17	..	29·686	50·7	43·1	47·7	44·3	66·9	37·0	47·4	45·4	3·4	6·0	2·2	+ 7·9	WSW : SW	SW : SSW	6·0	0·0	1·0	423	0·02
18	..	29·484	53·1	46·5	49·7	48·0	65·5	41·2	46·9	44·9	1·7	3·0	0·6	+10·1	S : SW	SSW : SSE	4·8	0·0	0·7	309	0·29
19	Apogee.	29·595	46·5	36·7	41·4	39·8	65·4	32·0	45·4	43·4	1·6	4·2	0·0	+ 2·0	SW	WSW : Calm	0·4	0·0	0·1	239	0·00
20	..	29·478	45·9	35·1	41·4	40·1	53·6	30·0	45·4	44·4	1·3	2·9	0·0	+ 2·3	Calm	SE : SSE	0·9	0·0	0·0	171	0·00
21	..	29·202	54·3	42·2	49·2	49·0	55·3	38·0	44·4	43·4	0·2	0·9	0·0	+10·4	SE : SSE	SW	4·7	0·0	0·7	372	0·43
22	First Quarter: In Equator.	29·118	53·9	42·4	47·8	43·5	69·7	41·5	43·9	42·4	4·3	6·8	1·8	+ 9·3	SW	SW	17·8	0·0	1·3	490	0·21
23	..	29·015	46·9	37·9	42·4	39·7	49·8	33·0	45·4	42·4	2·7	4·4	1·4	+ 4·3	SW : WSW	WSW : SW	3·1	0·0	0·2	343	0·10
24	..	28·638	49·5	39·5	45·1	40·8	58·6	35·0	45·4	43·4	4·3	6·3	0·0	+ 7·3	S : SW	SW : WSW	30·0	0·0	1·9	518	0·51
25	..	29·120	46·4	35·9	40·2	37·0	60·5	31·2	43·9	42·4	3·2	8·0	0·0	+ 2·6	WSW	WSW	1·8	0·0	0·4	362	0·00
26	..	29·333	48·1	37·7	43·5	39·2	56·8	34·0	43·4	42·4	4·3	8·1	0·0	+ 6·1	WSW	SW : WSW	13·7	0·0	1·6	526	0·32
27	..	28·847	53·9	43·3	49·0	46·0	56·7	42·8	43·1	40·9	3·0	8·4	0·0	+11·7	SW : WSW	W by S	30 +	0·0	4·2	737	0·35
28	..	29·143	50·9	38·2	43·8	38·7	53·5	32·2	42·9	40·7	5·1	7·2	1·6	+ 6·6	WSW	SW : WSW	30 +	0·1	4·3	692	0·12
29	Full: Greatest Dec. N.	29·061	48·9	34·0	40·9	39·7	49·3	30·5	42·4	40·6	1·2	2·9	0·0	+ 3·6	SW : SE	S : WSW	16·3	0·0	0·6	357	0·33
30	..	29·315	40·2	32·6	36·2	34·6	40·5	29·0	41·4	40·4	1·6	4·1	0·0	− 1·2	SSW	W : SW	2·6	0·0	0·3	314	0·55
31	Perigee.	29·708	43·4	31·5	37·5	33·3	57·1	25·0	40·4	38·4	4·2	7·9	0·0	0·0	SW	W by N : WSW	3·5	0·0	0·5	399	0·00
Means	..	29·378	50·5	41·1	46·0	43·1	57·9	37·5	44·9	43·1	2·9	5·6	0·5	+ 6·2	...	...	..	..	..	Sum 12762	Sum 5·45

BAROMETER READINGS FROM EYE-OBSERVATIONS.

The first minimum in the month was 29in·271 on the 4th.

The first maximum in the month was 29in·355 on the 5th; the second minimum ,, was 29in·208 on the 5th.
The second maximum ,, was 29in·530 on the 6th; the third minimum ,, was 29in·230 on the 6th.
The third maximum ,, was 29in·731 on the 7th; the fourth minimum ,, was 29in·332 on the 8th.
The absolute maximum ,, was 30in·171 on the 9th; the fifth minimum ,, was 29in·079 on the 11th.
The fifth maximum ,, was 29in·808 on the 12th; the sixth minimum ,, was 29in·267 on the 14th.
The sixth maximum ,, was 29in·397 on the 15th; the seventh minimum ,, was 29in·153 on the 15th.
The seventh maximum ,, was 29in·746 on the 17th; the eighth minimum ,, was 29in·464 on the 18th.
The eighth maximum ,, was 29in·625 on the 19th; the ninth minimum ,, was 29in·103 on the 21st.
The ninth maximum ,, was 29in·173 on the 22nd; the tenth minimum ,, was 28in·938 on the 23rd.
The tenth maximum ,, was 29in·082 on the 23rd; the absolute minimum ,, was 28in·530 on the 24th.
The eleventh maximum ,, was 29in·438 on the 26th; the twelfth minimum ,, was 28in·763 on the 27th.
The twelfth maximum ,, was 29in·241 on the 28th; the thirteenth minimum ,, was 28in·930 on the 28th.
The thirteenth maximum ,, was 29in·263 on the 28th; the fourteenth minimum ,, was 28in·932 on the 29th.
The range in the month was 1in·641.
The mean for the month was 29in·378, being 0in·453 *lower* than the average of the preceding 27 years.

TEMPERATURE OF THE AIR

The highest in the month was 57°·8 on the 6th; the lowest was 31°·5 on the 31st.
The range ,, was 26°·3.
The mean ,, of all the highest daily readings was 50°·5, being 5°·3 *higher* than the average of the preceding 27 years.
The mean ,, of all the lowest daily readings was 41°·1, being 5°·4 *higher* than the average of the preceding 27 years.
The mean daily range was 9°·4, being 0°·2 *less* than the average of the preceding 27 years.
The mean for the month was 46°·0, being 5°·6 *higher* than the average of the preceding 27 years.

MONTH and DAY, 1868.	ELECTRICITY.		CLOUDS AND WEATHER.	
	A.M.	P.M.	A.M.	P.M.
Dec. 1	o	o	10	10, oc.-r : 10, th.-r, f
2	o	o	10, ci.-s, f	10 : 10, th.-r
3	o	o	9, ci, ci.-s, h.-r	10, oc.-r : v : v, cu.-s, ci.-s
4	o	o	7, ci.-s, cu.-s, sc, w, oc.-r	10, cu.-s, sc, h.-sqs, r : 10, st.-w, h.-r
5			10, cu.-s, sc, w : 10, th.-r	10, sc, r : v, h.-g : v, h.-g
6			10, cu.-s, glm, th.-r	10, h.-r, h.-g : 10, oc.-shs, g
7			7, ci, ci.-s, cu.-s, sc	10 : 10, h.-r
8			10, c.-h.-r : 10 : 7, ci, ci.-s, sc, w	9, ci, ci.-s, r : v, h.-r : 10, r
9			9, ci.-s, ci.-cu, cu.-s	v, ci.-s, cu.-s, ci.-cu : 10, th.-cl
10			6, ci, ci.-s, s, w : 10, ci.-cu, ci.-s, cu.-s, w	10, ci, ci.-s, cu.-s, s, w : v, th.-cl, w
11			9, ci.-s,cu.-s,ci,sc,th.-r,w : 10, sc, th.-r, st.-w	10, cu.-s,ci.-s,th.-r: v, li.-cl : v, oc.-r
12		o	2, ci, ci.-s, h, h.-fr	10, ci.-s, cu.-s : v : 10, ci.-s
13	o	o	10, ci.-s, cu.-s, ci.-cu, sl.-r	10 : v, li.-cl, h
14	o	o	10 : 9, th.-cl, ci.-s, w	10, ci.-s, sl.-r, w : 10, h.-r, st.-w
15	o	o	2, ci, ci.-cu, ci.-s, w : 4, ci, ci.-cu, ci.-s	9, ci, ci.-s, cu.-s : 10, h.-r, st.-w
16	o	o	9, ci, ci.-cu, ci.-s, cu.-s, h.-r	v, ci, r : 10, r, w : o, w
17	o	o	v, ci, ci.-s	10, ci.-s, r : 10, th.-r, w
18	o	o	10, h.-r, w : v, ci.-cu, ci.-s	v, ci : 10, h.-r
19	o	o : w	1, ci, h	4, ci, ci.-cu, sl.-f : o, d
20	w	w : o	10, ci.-s, d	10, ci.-s : 10
21	o	o	10 : 10, sc, c.-h.-r, w	10, sc, oc.-r : 10, r, w
22	o	o	o	o : 10, ci.-s, sl.-r : 10, sqs, r, l
23	o	o	10, r . 10, oc.-r	v, cu.-s, ci.-s, ci.-cu : 1, ci, d
24	o	o	10, h.-r : 8, ci, ci.-s, r	10, sc, oc.-r, w : 10, r, st.-w : v, th.-cl
25			10, h.-fr : o, h	3, th.-cl, h : 10,sc,th.-cl,th.-r: v, ci, ci.-s
26			4, ci.-cu, ci.-s, sl.-r, w	v, ci.-s, ci.-cu, cu.-s : 10, h.-r, st.-w
27			10, sc, h.-g, h.-r	10, h.-g, r : v, st.-w : vv, h.-r, st.-w
28			9, ci.-s, s, st.-w : 10, st.-w, oc.-r	10, sc,fr.-h.-shs,h.-g: v, st.-w : o
29			10, cu.-s, h.-r, st.-w	10, h.-r, w : vv, cu.-s, ci.-s, ci.-cu
30			10, h.-r, f	8, ci.-s,h,f,th.-r: th.-cl : vv, h.-r
31			3, ci, ci.-s, w	v, cu.-s, ci.-cu, ci.-s, f : o, sl. f, h.-fr

HUMIDITY OF THE AIR.

Temperature of the Dew Point.

The highest in the month was $55^\circ\cdot4$ on the 6th; and the lowest was $31^\circ\cdot5$ on the 31st.

The mean ,, was $43^\circ\cdot1$, being $6^\circ\cdot0$ *higher* than the average of the preceding 27 years.

Elastic Force of Vapour.—The mean for the month was $0^{in}\cdot278$, being $0^{in}\cdot055$ *greater* than the average of the preceding 27 years.

Weight of Vapour in a Cubic Foot of Air.—The mean for the month was $3^{grs}\cdot2$, being $0^{gr}\cdot6$ *greater* than the average of the preceding 27 years.

Degree of Humidity.—The mean for the month was 90 (that of Saturation being represented by 100), being 2 *greater* than the average of the preceding 27 years.

Weight of a Cubic Foot of Air.—The mean for the month was 538 grains, being 14 grains *less* than the average of the preceding 27 years.

CLOUDS.

The mean amount for the month, a clear sky being represented by 0 and a cloudy sky by 10, was 7·4.

OZONE.

The mean amount for the month, on a scale ranging from 0 to 10, was 2·5.

WIND.

The proportions were of N. 1, S. 13, W. 12, E. 3, and Calm 2. The greatest pressure in the month was $30^{lbs}\cdot0$, or more than 30^{lbs}, on the square foot on the 5th, 6th, 7th, 10th, 11th, 24th, 27th, and 28th.

RAIN.

Fell on 23 days in the month, amounting to $5^{in}\cdot45$, as measured in the simple cylinder gauge partly sunk below the ground; being $3^{in}\cdot57$ *greater* than the average fall of the preceding 53 years.

ELECTRICITY.—The insulating lamp was not burning from December 5 to 11 and 25 to 31.

The following table contains the highest and lowest readings of the Barometer, reduced to 32° Fahrenheit, extracted from the photographic records. The readings are accurate; but the times are liable to great uncertainty, as the barometer frequently remains at its highest or lowest point through several hours. The time given is the middle of the stationary period. Where the symbol : follows the time, it denotes that the quicksilver has been sensibly stationary through a period of more than one hour.

MAXIMA.		
Approximate Mean Solar Time, 1868.		Reading.
	d h m	in.
January	1. 22. 0	30·106
	6. 22. 30	29·923
	9. 22. 15	30·118
	11. 22. 5	29·840
	13. 16. 45:	29·690
	15. 20. 50:	30·120
	18. 23. 30	28·914
	19. 11. 30	28·990
	20. 21. 40:	29·568
	23. 21. 30:	30·181
	26. 16. 35	30·207
	29. 9. 25	30·242
February	2. 0. 20	29·818
	4. 10. 50	30·280
	5. 23. 30	30·200
	8. 22. 20	30·425
	15. 22. 58	30·410
	19. 22. 11:	30·022
	21. 6. 35	29·835
	23. 6. 25	30·200
	25. 10. 50	30·240
March	2. 23. 0	30·107
	6. 12. 0	29·650
	8. 21. 11	29·520
	10. 11. 35	29·448
	14. 8. 45	30·113
	17. 21. 15	30·156
	21. 11. 25	29·932

MINIMA.		
Approximate Mean Solar Time, 1868.		Reading.
	d h m	in.
January	1. 4. 50:	29·970
	6. 3. 45:	29·707
	7. 13. 30:	29·840
	11. 4. 10:	29·677
	12. 20. 35	29·300
	14. 10. 10	29·495
	18. 12. 35	28·766
	19. 5. 20	28·857
	19. 19. 45	28·863
	21. 18. 40:	28·855
	25. 1. 10	29·430
	28. 5. 15	29·800
February	0. 23. 45	29·115
	2. 12. 40	29·390
	5. 10. 50	30·030
	7. 15. 50	29·444
	14. 17. 50:	29·890
	18. 23. 45	29·380
	2c. 16. 45	29·690
	22. 10. 20	29·600
	24. 4. 40	30·048
	29. 8. 15	29·052
March	5. 0. 10	29·480
	7. 17. 35	28·832
	9. 17. 30:	29·262
	11. 10. 15	29·104
	16. 16. 55	29·674
	19. 3. 35	29·708

MAXIMA.		
Approximate Mean Solar Time, 1868.		Reading.
	d h m	in.
March	24. 23. 30	29·985
	28. 21. 45:	30·444
April	1. 21. 40:	30·295
	10. 21. 0	29·906
	14. 21. 0	30·216
	21. 21. 0	29·620
	23. 9. 0	29·619
	26. 8. 0	30·040
	27. 21. 0	29·981
May	1. 10. 20	30·140
	5. 12. 50	30·090
	14. 10. 10:	30·185
	17. 12. 30:	30·021
	23. 12. 20	29·601
	27. 20. 0:	30·099
	30. 21. 0:	29·944
June	3. 0. 0	29·973
	5. 13. 0:	30·067
	11. 21. 0:	30·109
	15. 21. 0:	30·127
	17. 22. 15	30·140
	26. 11. 50	30·190
	28. 20. 40:	30·205
July	10. 11. 55	30·045
	13. 12. 5	29·947
	19. 11. 25	29·945
	23. 21. 50	30·254
August	0. 20. 50	30·160

MINIMA.		
Approximate Mean Solar Time, 1868.		Reading.
	d h m	in.
March	23. 0. 50	29·625
	25. 17. 35	29·799
April	1. 4. 15:	30·197
	8. 3. 0	29·230
	13. 3. 0	29·852
	19. 21. 0	28·749
	22. 9. 0	29·481
	24. 3. 0	29·354
	27. 3. 0	29·884
	28. 9. 0	29·824
May	3. 6. 0	29·666
	9. 4. 30:	29·590
	16. 5. 0	29·880
	23. 1. 58	29·365
	24. 7. 30	29·467
	29. 7. 10	29·735
June	2. 4. 10:	29·756
	4. 7. 35	29·840
	10. 5. 45:	29·950
	14. 7. 15	29·990
	17. 4. 30:	29·976
	22. 4. 15	29·530
	27. 6. 45	30·035
July	3. 4. 30:	29·804
	13. 3. 45	29·839
	15. 5. 15:	29·724
	22. 6 0	29·750
	28. 14. 15	29·469

MAXIMA.		MINIMA.		MAXIMA.		MINIMA.	
Approximate Mean Solar Time, 1868.	Reading.	Approximate Mean Solar Time, 1868.	Reading.	Approximate Mean Solar Time, 1868.	Reading.	Approximate Mean Solar Time, 1868.	Reading.
d h m	in.	d h m	in.	d h m	in.	d h m	in.
August 8. 19. 20:	30·030	August 6. 16. 50	29·495	October 30. 11. 45	30·151	October 28. 18. 5	29·563
12. 1. 25	29·573	11. 8. 20	29·374	November 12. 22. 0	30·471	November 4. 9. 10	29·430
15. 9. 10	29·768	13. 3. 40	29·331	15. 11. 0	30·195	14. 6. 25:	30·022
20. 7. 50	29·851	17. 21. 0	29·433	17. 21. 12	30·205	16. 7. 5	30·033
25. 21. 55	30·040	22. 6. 30	28·960	19. 9. 0	30·206	18. 2. 20	30·135
28. 23. 56	30·102	26. 17. 35	29·773	24. 6. 20	29·735	22. 11. 35	28·925
September 1. 20. 20:	30·153	31. 4. 25	29·930	26. 21. 45:	29·845	25. 3. 10	29·433
5. 10. 5	30·081	September 4. 4. 30:	29·951	28. 22. 0	29·864	27. 15. 50	29·760
8. 21. 55:	30·206	7. 4. 40:	29·851	December 4. 19. 25	29·399	December 4. 7. 40	29·224
20. 14. 30:	29·593	19. 4. 5:	29·325	5. 19. 20	29·550	5. 2. 30	29·180
25. 22. 58	29·599	25. 4. 10	29·161	6. 23. 0	29·768	6. 10. 35	29·131
27. 19. 50	29·352	27. 8. 0	29·230	9. 7. 20	30·186	7. 15. 50	29·260
October 2. 8. 10:	29·960	29. 19. 50	29·061	11. 22. 40:	29·828	11. 2. 33	29·065
5. 9. 15	29·960	October 3. 10. 10	29·370	15. 0. 30	29·405	14. 8. 20	29·234
7. 20. 50	30·053	6. 11. 45	29·714	16. 23. 59	29·760	15. 10. 35	29·082
10. 22. 45	30·006	9. 4. 30	29·823	19. 4. 35	29·630	17. 19. 55	29·420
14. 8. 5	30·023	12. 3. 35	29·890	21. 22. 5	29·185	21. 13. 30	29·034
17. 9. 30	29·556	16. 5. 0	29·420	23. 7. 40	29·100	22. 17. 50:	28·910
19. 20. 20	29·820	18. 2. 20	29·486	25. 22. 45	29·465	24. 2. 10	28·520
22. 8. 0:	29·899	20. 17. 55	29·493	27. 20. 57	29·251	27. 0. 35	28·726
23. 13. 50	29·765	22. 22. 30	29·535	28. 14. 50	29·353	28. 4. 15	28·870
24. 21. 35	29·660	24. 5. 40	29·132	31. 22. 50	29·993	29. 1. 10	28·825
27. 20. 30	30·242	25. 14. 30	29·490				

ABSOLUTE MAXIMA AND MINIMA READINGS OF THE BAROMETER for each Month in the YEAR 1868.
[Extracted from the preceding Table.]

1868, MONTH.	Readings of the Barometer.		Range of Reading in each Month.
	Maxima.	Minima.	
	in.	in.	in.
January	30·242	28·766	1·476
February	30·425	29·052	1·373
March	30·444	28·832	1·612
April	30·295	28·749	1·546
May	30·185	29·365	0·820
June	30·205	29·530	0·675
July	30·254	29·469	0·785
August	30·160	28·960	1·200
September	30·206	29·061	1·145
October	30·242	29·132	1·110
November	30·471	28·925	1·546
December	30·186	28·520	1·666

The highest reading in the year was $30^{in}\cdot471$ in the month of November. The lowest reading in the year was $28^{in}\cdot520$ in the month of December.
The range of reading in the year was $1^{in}\cdot951$.

MONTHLY MEANS of RESULTS for METEOROLOGICAL ELEMENTS.

1868, MONTH.	Mean Reading of the Barometer.	TEMPERATURE OF THE AIR.							Mean Temperature of Dew Point.	Mean Elastic Force of Vapour.	Mean Weight of Vapour in a Cubic Foot of Air.	Mean additional Weight required to saturate a Cubic Foot of Air.
		Highest.	Lowest.	Range in the Month.	Mean of all the Highest.	Mean of all the Lowest.	Mean Daily Range.	Mean Temperature.				
	in.	°	°	°	°	°	°	°	°	in.	grs.	grs.
January ..	29.741	51.9	22.8	29.1	41.4	32.8	8.6	37.2	33.4	0.191	2.2	0.4
February..	29.970	61.7	26.7	35.0	49.9	36.8	13.1	43.0	37.3	0.223	2.6	0.6
March	29.824	58.5	28.1	30.4	52.9	36.8	16.1	44.0	38.3	0.231	2.7	0.6
April	29.782	68.9	28.9	40.0	58.8	40.1	18.7	48.1	41.4	0.261	3.0	0.8
May	29.845	87.0	33.9	53.1	70.5	46.1	24.4	57.3	49.0	0.348	3.9	1.4
June	29.980	88.0	44.7	43.3	76.3	50.8	25.5	62.0	51.4	0.379	4.2	2.0
July......	29.892	96.6	48.2	48.4	82.0	55.7	26.3	67.5	54.6	0.427	4.7	2.7
August ...	29.736	90.5	47.8	42.7	75.1	55.0	20.1	63.6	54.5	0.425	4.7	1.8
September.	29.693	92.1	43.6	48.5	71.7	51.1	20.6	60.5	52.2	0.391	4.4	1.5
October ...	29.793	66.6	29.3	37.3	56.8	40.1	16.7	47.9	44.4	0.293	3.3	0.5
November .	29.836	57.1	26.1	31.0	46.9	36.1	10.8	41.5	37.6	0.225	2.6	0.4
December .	29.378	57.8	31.5	26.3	50.5	41.1	9.4	46.0	43.1	0.278	3.2	0.4
Means	29.789	73.1	34.3	38.8	61.1	43.6	17.5	51.6	44.8	0.306	3.5	1.1

1868, MONTH.	Mean Degree of Humidity. (Sat. = 100.)	Mean Weight of a Cubic Foot of Air.	Mean Amount of Cloud. 0—10	RAIN.		WIND.										
				Number of Rainy Days.	Amount collected on the Ground. Gauge read Daily.	From Osler's Anemometer.										From Robinson's Anemometer.
						Number of Days for Mean Direction of the Wind referred to different Points of Azimuth.								Number of Calm Days and Days on which the Pressure of the Wind was less than ¼ lb. on the Sq. Foot.	Mean Daily Pressure in lbs. on the Square Foot.	Mean Daily Horizontal Movement of Air in Miles.
						N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.			
		grs.			in.											
January.............	86	555	8.4	21	4.19	4	6	0	1	2	10	4	1	3	0.98	355
February............	80	553	6.3	11	1.28	1	0	0	0	3	14	8	3	0	1.04	361
March	80	549	6.4	16	1.07	3	1	0	1	4	11	7	2	2	0.64	358
April...............	78	543	6.9	10	2.08	5	3	2	2	4	7	3	2	2	0.57	293
May.................	74	534	4.9	6	1.67	1	4	5	2	4	11	2	0	2	0.32	234
June................	68	531	4.4	5	0.47	4	4	1	1	2	9	4	4	1	0.16	208
July................	63	524	4.9	6	1.06	8	6	2	1	1	7	3	2	1	0.25	231
August	73	526	6.5	12	2.61	2	2	3	3	4	9	6	1	1	0.52	263
September...........	74	528	5.2	9	1.52	1	7	4	3	3	6	2	0	4	0.44	240
October	88	543	5.8	13	2.59	2	2	1	1	3	9	8	2	3	0.42	262
November............	87	552	7.8	12	1.16	7	7	1	2	2	5	3	1	2	0.68	288
December	90	538	7.4	23	5.45	1	1	1	2	5	15	4	0	2	1.37	412
Means	78	540	6.2	Sum 144	Sum 25.15	Sum 39	Sum 43	Sum 20	Sum 19	Sum 37	Sum 113	Sum 54	Sum 18	Sum 23	0.62	292

From February 1 to 11 Robinson's Anemometer was not in action. The mean daily horizontal movement of the air for the month of February has been formed from the records for the remaining 18 days.

(I.)—Reading of a Thermometer whose bulb is sunk to the depth of 25·6 feet (24 French feet) below the surface of the soil, at Noon on every Day, except Sundays, Good Friday, and Christmas Day.

Days of the Month, 1868.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	52·29	51·61	S	49·95	49·56	49·46	49·84	50·65	51·67	52·60	..	..
2	52·27	S	50·70	49·97	49·55	49·47	49·87	S	51·71	52·62	..	..
3	52·30	51·53	50·65	49·97	S	49·50	49·90	50·74	51·77	52·60	..	..
4	52·24	51·50	50·65	49·94	49·54	49·45	49·88	50·82	51·80	S	..	..
5	S	51·47	50·60	S	49·52	49·46	S	50·79	51·85	52·70	..	..
6	52·21	51·42	50·57	49·90	49·52	49·52	49·97	50·80	S	52·73	..	..
7	52·18	51·40	50·56	49·90	49·50	S	49·97	50·85	51·93	52·75	..	..
8	52·16	51·36	S	49·85	49·51	49·52	49·97	50·82	51·92	52·77	..	..
9	52·16	S	50·50	49·85	49·53	49·55	50·10	S	51·96	52·80	..	..
10	52·13	51·32	50·47	Good Friday.	S	49·52	50·07	50·94	52·00	52·90	..	..
11	52·08	51·30	50·45	49·80	49·48	49·54	50·06	50·96	52·05	S	..	..
12	S	51·20	50·44	S	49·50	49·57	S	51·06	52·05	..	..	..
13	52·09	51·22	50·42	49·74	49·48	49·56	50·15	51·01	S	..	..	..
14	52·07	51·20	50·38	49·75	49·47	S	50·16	51·05	52·10	..	..	..
15	52·07	51·12	S	49·76	49·50	49·61	50·20	51·10	52·15	..	..	..
16	52·04	S	50·35	49·75	49·49	49·62	50·31	S	52·18	..	..	..
17	52·02	51·10	50·32	49·68	S	49·64	50·23	51·12	52·20	..	..	..
18	51·97	51·06	50·25	49·70	49·48	49·65	50·27	51·19	52·23	..	..	..
19	S	51·00	50·25	S	49·50	49·65	S	51·21	52·25	..	..	..
20	51·91	51·00	50·22	49·62	49·45	49·70	50·32	51·20	S	..	..	..
21	51·88	50·98	50·23	49·67	49·47	S	50·36	51·30	52·35	..	..	..
22	51·86	50·95	S	49·67	49·45	49·65	50·40	51·30	52·37	..	..	53·10
23	51·82	S	50·18	49·62	49·42	49·71	50·38	S	52·37	..	..	53·10
24	51·77	50·88	50·12	49·64	S	49·74	50·40	51·38	52·41	..	..	53·05
25	51·80	50·88	50·11	49·62	49·46	49·75	50·46	51·39	52·42	..	..	Christmas Day
26	S	50·84	50·07	S	49·43	49·77	S	51·45	52·47	..	..	53·00
27	51·70	50·80	50·07	49·62	49·46	49·78	50·55	51·42	S	..	..	S
28	51·72	50·75	50·06	49·57	49·48	S	50·55	51·51	52·52	..	..	52·95
29	51·66	50·75	S	49·58	49·45	49·83	50·55	51·55	52·54	..	..	52·95
30	51·64		50·02	49·58	49·47	49·85	50·56	S	52·55	..	..	52·95
31	51·64		49·98		S		50·63	51·63		..		52·96
Means.	51·99	51·15	50·33	49·75	49·49	49·62	50·23	51·12	52·15	..	..	..

At temperatures exceeding 52°·8 the fluid of this thermometer enters the upper bulb; all readings in the table in excess of that value are estimated readings only, and therefore liable to some uncertainty. From October 12 to December 21 no estimation could be made.

(II.)—Reading of a Thermometer whose bulb is sunk to the depth of 12·8 feet (12 French feet) below the surface of the soil, at the same times.

Days of the Month, 1868.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	50·17	47·77	S	47·08	47·75	50·12	52·81	55·67	..	..	S	53·36
2	50·07	S	46·95	47·08	47·78	50·30	52·92	S	..	..	56·10	53·30
3	50·07	47·66	46·94	47·15	S	50·25	53·05	55·92	..	..	56·02	53·22
4	49·92	47·62	46·95	47·15	47·90	50·35	53·05	56·00	..	..	55·91	53·15
5	S	47·61	46·92	S	47·91	50·50	S	56·12	..	..	55·80	53·05
6	49·82	47·53	46·92	47·12	48·01	50·65	53·32	56·11	..	..	55·65	S
7	49·69	47·55	46·95	47·16	48·03	S	53·40	56·21	..	..	55·57	52·88
8	49·63	47·48	S	47·12	48·12	50·74	53·48	56·55	..	..	S	52·80
9	49·50	S	46·94	47·15	48·20	50·86	53·65	S	..	..	55·45	52·63
10	49·47	47·45	46·92	Good Friday.	S	50·91	53·75	56·44	..	..	55·36	52·62
11	49·35	47·45	46·97	47·19	48·30	51·00	53·81	56·48	..	..	55·28	52·56
12	S	47·35	46·92	S	48·39	51·16	S	56·55	..	..	55·21	52·42

(II.)—Reading of a Thermometer whose bulb is sunk to the depth of 12·8 feet (12 French feet) below the surface of the soil, at the same times—*concluded.*

Days of the Month, 1868.	January	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
13	49·25	47·38	46·99	47·20	48·44	51·25	54·05	56·72	..	..	55·12	*S*
14	49·12	47·37	46·95	47·22	48·50	*S*	54·09	56·72	..	..	55·04	52·38
15	49·06	47·28	*S*	47·32	48·64	51·41	54·21	56·88	..	..	*S*	52·35
16	48·97	*S*	46·98	47·33	48·75	51·48	54·28	*S*	..	..	54·81	52·25
17	48·86	47·30	46·97	47·31	*S*	51·58	54·31	56·80	..	..	54·75	52·20
18	48·75	47·23	46·96	47·37	48·86	51·67	54·42	57·16	..	..	54·65	52·17
19	*S*	47·18	47·03	*S*	49·02	51·75	*S*	..	..	..	54·55	52·09
20	48·51	47·20	47·01	47·37	49·00	51·90	54·58	..	..	..	54·41	*S*
21	48·44	47·18	47·02	47·45	49·11	*S*	54·71	..	..	..	54·33	52·03
22	48·35	47·12	*S*	47·47	49·20	51·92	54·82	..	..	..	*S*	51·97
23	48·15	*S*	47·00	47·45	49·23	52·09	54·80	..	..	56·82	54·17	51·88
24	48·06	47·10	47·04	47·52	*S*	52·18	54·88	..	..	56·75	54·03	51·84
25	48·07	47·11	47·02	47·54	49·48	52·28	55·02	..	..	*S*	53·93	Christmas Day
26	*S*	47·04	47·02	*S*	49·52	52·37	*S*	..	..	56·62	53·86	51·75
27	47·93	47·06	47·05	47·63	49·65	52·50	55·26	..	..	56·55	53·72	*S*
28	47·93	47·00	47·08	47·65	49·80	*S*	55·34	..	..	56·47	53·62	51·64
29	47·86	47·01	*S*	47·67	49·83	52·65	55·30	..	..	56·38	*S*	51·60
30	47·80		47·08	47·76	49·96	52·80	55·44	..	..	56·35	53·45	51·51
31	47·78		47·08		*S*		55·62	..		56·30		51·43
Means .	48·91	47·32	46·99	47·33	48·75	51·41	54·24	..	..	..	54·83	52·35

At temperatures exceeding 56°·8 the fluid of this thermometer enters the upper bulb : readings in excess of that value in the table are estimated, and therefore somewhat uncertain. No estimation could be made from August 19 to October 22.

(III.)—Reading of a Thermometer whose bulb is sunk to the depth of 6·4 feet (6 French feet) below the surface of the soil, at the same times.

Days of the Month, 1868.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	47·02	44·91	*S*	46·66	49·21	54·33	58·30	62·22	61·42	60·31	*S*	50·64
2	46·88	*S*	45·82	46·77	49·36	54·49	58·48	*S*	61·40	60·20	54·80	50·55
3	46·72	44·96	45·84	46·79	*S*	54·70	58·70	62·32	61·34	60·00	54·68	50·40
4	46·52	45·11	46·00	46·85	49·65	54·76	58·67	62·40	61·35	*S*	54·60	50·33
5	*S*	45·19	46·00	*S*	49·83	55·00	*S*	62·50	61·32	59·80	54·51	50·32
6	46·17	45·15	46·06	47·00	50·13	55·15	59·09	62·52	*S*	59·60	54·40	*S*
7	46·00	45·30	46·22	47·15	50·24	*S*	59·17	62·60	61·49	59·40	54·30	50·29
8	45·84	45·29	*S*	47·21	50·50	55·24	59·26	..	61·40	59·22	*S*	50·26
9	45·60	*S*	46·33	47·43	50·73	55·40	59·42	..	61·50	59·10	54·00	50·22
10	45·55	45·34	46·35	Good Friday.	*S*	55·50	59·45	..	61·59	58·95	53·70	50·40
11	45·37	45·35	46·40	47·70	50·95	55·60	59·48	..	61·65	*S*	53·43	50·50
12	*S*	45·21	46·32	*S*	51·22	55·71	*S*	..	61·66	58·63	53·15	50·51
13	45·11	45·22	46·35	47·74	51·33	55·80	59·64	..	*S*	58·40	52·90	*S*
14	44·90	45·30	46·23	47·63	51·50	*S*	59·80	..	61·60	58·27	52·72	50·58
15	44·82	45·20	*S*	47·77	51·75	56·01	60·00	..	61·60	58·15	*S*	50·51
16	44·78	*S*	46·41	47·77	51·91	56·14	60·17	..	61·60	58·01	52·38	50·40
17	44·76	45·25	46·44	47·73	*S*	56·36	60·14	..	61·51	57·86	52·22	50·33
18	44·90	45·21	46·50	47·84	52·27	56·58	60·32	..	61·40	*S*	52·10	50·39
19	*S*	45·22	46·62	*S*	52·51	56·72	*S*	..	61·30	57·48	51·93	50·31
20	45·04	45·19	46·62	47·98	52·38	57·01	60·73	..	*S*	57·31	51·80	*S*
21	45·26	45·14	46·63	48·18	52·80	*S*	60·91	..	61·25	57·20	51·67	50·15
22	45·03	45·14	*S*	48·27	53·01	57·22	61·11	..	61·19	56·96	*S*	50·08
23	45·04	*S*	46·57	48·22	53·18	57·50	61·10	*S*	61·00	56·66	51·40	49·95
24	45·15	45·22	46·75	48·49	*S*	57·70	61·30	62·32	60·95	56·40	51·20	49·52
25	45·14	45·33	46·78	48·62	53·61	57·79	61·52	62·18	60·81	*S*	51·15	Christmas Day
26	*S*	45·32	46·82	*S*	53·67	57·90	*S*	62·12	60·81	55·91	51·11	49·82

(III.)—Reading of a Thermometer whose bulb is sunk to the depth of 6·4 feet (6 French feet) below the surface of the soil, at the same times—*concluded.*

Days of the Month, 1868.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
27	45·00	45·45	46·70	48·88	53·81	58·00	61·90	61·98	*S*	55·70	51·00	*S*
28	44·89	45·35	46·73	49·00	53·95	*S*	61·96	61·82	60·60	55·55	50·90	49·48
29	44·86	45·62	*S*	49·08	53·95	58·09	61·82	61·70	60·52	55·40	*S*	49·41
30	44·82		46·72	49·22	54·10	58·24	62·02	*S*	60·40	55·25	50·75	49·18
31	44·86		46·66		*S*		62·13	61·50		55·11		49·03
Means.	45·41	45·24	46·42	47·84	51·83	56·27	60·24	..	61·26	57·81	52·65	50·14

At temperatures beyond 62°·5 the fluid of this thermometer enters the upper bulb: the readings in excess of this value in the table are estimated, and therefore uncertain. From August 8 to 22 no estimation could be made.

(IV.)—Reading of a Thermometer whose bulb is sunk to the depth of 3·2 feet (3 French feet) below the surface of the soil, at the same times.

Days of the Month, 1868.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	42·00	42·00	*S*	44·95	50·05	57·65	62·48	66·23	62·17	59·90	*S*	46·34
2	41·53	*S*	44·37	45·18	50·60	57·81	62·70	*S*	62·31	59·52	51·82	46·30
3	41·20	42·66	44·32	45·51	*S*	58·10	62·91	66·33	62·56	59·00	52·10	46·50
4	40·93	42·84	44·54	45·93	51·63	57·97	63·05	66·58	62·90	*S*	51·93	46·78
5	*S*	42·61	44·87	*S*	52·22	57·91	*S*	66·91	63·28	58·01	51·90	47·21
6	40·34	42·52	45·16	46·63	52·41	58·00	63·02	67·01	*S*	57·88	51·45	*S*
7	40·23	42·70	45·14	47·11	52·28	*S*	62·84	67·28	63·85	57·78	50·63	48·19
8	40·12	42·67	*S*	47·43	52·40	58·41	62·74	67·20	63·91	57·66	*S*	48·48
9	39·90	*S*	44·80	47·70	52·68	58·50	62·94	*S*	64·14	57·30	49·05	48·59
10	39·80	42·33	44·50	GoodFriday.	*S*	58·31	63·14	66·92	64·02	57·10	48·50	48·58
11	39·74	42·25	44·40	47·05	53·40	58·31	63·38	66·71	63·82	*S*	48·23	48·35
12	*S*	42·28	44·32	*S*	53·61	58·46	*S*	66·77	63·55	56·66	48·20	48·29
13	39·62	42·18	44·45	46·40	53·66	58·73	63·78	66·33	*S*	56·41	48·15	*S*
14	40·00	42·22	44·74	46·21	53·90	*S*	63·96	65·92	63·11	56·38	48·25	47·71
15	40·71	42·23	*S*	46·46	54·31	59·71	64·21	65·50	62·80	56·30	*S*	47·82
16	41·32	*S*	45·18	46·78	54·61	60·18	64·48	*S*	62·60	56·00	47·95	48·07
17	41·71	42·35	45·18	47·15	*S*	60·60	64·78	65·12	62·35	55·76	47·65	48·11
18	42·25	42·12	45·33	47·58	55·22	60·90	65·33	65·05	62·18	*S*	47·55	47·98
19	*S*	42·14	45·28	*S*	55·65	61·20	*S*	64·90	62·10	54·90	47·56	48·00
20	42·89	42·42	45·03	47·86	56·00	61·51	66·00	64·76	*S*	54·21	47·55	*S*
21	42·82	42·44	44·96	48·08	56·59	*S*	66·20	64·75	61·72	53·60	47·20	47·34
22	42·20	42·73	*S*	48·26	56·70	61·67	66·53	64·41	61·57	53·10	*S*	47·10
23	41·86	*S*	45·46	48·60	56·62	61·90	66·60	*S*	61·40	52·62	47·10	47·35
24	41·60	42·96	45·45	48·98	*S*	61·60	66·87	63·60	61·32	52·42	47·55	46·96
25	41·12	43·12	45·04	49·08	56·35	61·21	66·65	63·07	61·67	*S*	47·44	ChristmasDay
26	*S*	43·53	44·63	*S*	56·16	61·20	*S*	62·75	60·96	52·28	47·20	46·61
27	41·03	44·03	44·43	49·45	56·30	61·32	66·60	62·44	*S*	52·50	47·10	*S*
28	40·88	44·23	44·68	49·57	56·55	*S*	66·64	62·42	60·55	52·26	47·02	46·28
29	41·25	44·50	*S*	49·45	56·75	62·00	66·55	62·22	60·40	51·76	*S*	46·20
30	41·48		44·91	49·68	57·11	62·43	66·67	*S*	60·11	51·65	46·62	45·63
31	41·48		44·90		*S*		66·25	62·02		51·45		45·06
Means.	41·11	42·72	44·85	47·48	54·38	59·83	64·71	65·12	62·36	55·35	48·62	47·30

(V.)—Reading of a Thermometer whose bulb is sunk to the depth of 1 inch below the surface of the soil, within the case which covers the tops of the deep-sunk Thermometers, at the same times.

Days of the Month, 1868.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	34·3	48·9	S	47·3	56·0	62·5	64·1	68·5	63·6	57·5	S	43·3
2	34·7	S	46·6	49·0	56·0	62·0	67·0	S	64·0	55·1	53·0	45·9
3	34·0	44·1	47·5	48·5	S	60·9	68·0	73·0	65·9	53·0	51·1	49·0
4	34·7	41·2	48·4	48·2	58·5	60·8	65·1	75·2	67·9	S	52·0	50·0
5	S	43·5	50·0	S	55·4	60·5	S	74·3	68·5	56·3	47·2	51·1
6	36·3	44·0	45·2	52·3	53·3	63·1	65·1	71·7	S	57·2	42·0	S
7	34·4	43·1	44·6	52·5	54·0	S	65·0	71·5	69·0	55·5	41·2	50·0
8	35·2	42·6	S	54·3	58·0	60·2	68·4	69·1	67·0	53·5	S	51·0
9	35·1	S	42·6	46·0	60·0	60·3	69·8	S	65·6	55·6	43·0	47·2
10	35·2	42·5	45·0	Good Friday.	S	62·3	69·0	71·6	64·0	55·0	42·6	48·2
11	35·3	44·4	45·6	45·3	58·3	62·0	70·1	70·3	64·1	S	44·9	51·2
12	S	40·0	45·8	S	58·0	63·9	S	67·4	65·0	63·5	45·5	42·8
13	42·2	43·1	48·5	45·5	58·8	66·0	68·5	66·9	S	54·0	45·2	S
14	44·5	43·7	48·6	48·5	60·0	S	68·0	64·3	61·3	54·5	45·6	49·0
15	45·1	45·0	S	47·9	60·9	66·2	71·8	67·0	62·0	53·8	S	50·1
16	44·1	S	47·2	51·3	62·0	68·1	74·1	S	61·9	53·8	41·5	48·0
17	47·8	41·5	46·9	53·0	S	67·5	74·6	66·6	62·2	52·0	45·0	47·2
18	45·8	43·2	45·1	49·5	61·0	67·1	72·9	66·0	62·9	S	45·5	49·1
19	S	44·4	44·9	S	66·5	66·0	S	66·0	61·2	45·0	44·2	45·8
20	42·6	41·0	43·8	50·0	65·3	69·0	71·1	64·0	S	44·3	41·5	S
21	40·2	45·8	48·3	52·0	61·0	S	75·0	64·6	61·6	49·0	42·0	46·9
22	40·5	46·1	S	53·1	61·8	65·4	76·6	62·3	63·2	47·0	S	48·8
23	37·5	S	48·8	52·7	60·4	63·6	74·2	S	60·1	49·9	49·0	45·2
24	36·1	46·0	42·0	51·5	S	64·0	69·4	61·0	60·2	48·4	43·8	46·9
25	39·6	48·5	43·7	50·2	59·6	65·2	69·0	60·0	59·0	S	44·2	Christmas Day
26	S	47·4	43·2	S	60·1	64·6	S	61·4	60·7	51·5	45·5	44·0
27	38·4	47·5	47·3	53·1	60·2	68·8	73·0	64·1	S	48·0	44·5	S
28	43·6	48·1	45·8	50·0	61·9	S	74·4	61·0	59·2	47·0	43·0	44·2
29	40·6	47·5	S	54·4	64·5	65·9	67·5	62·0	60·4	49·9	S	44·0
30	41·3		43·8	55·4	62·1	66·6	66·6	S	58·0	48·0	42·9	41·2
31	45·9		44·6		S		69·5	63·6		51·5		41·3
Means.	39·4	44·5	45·9	50·5	59·8	64·3	69·9	66·7	63·0	52·2	45·0	47·0

(VI.)—Reading of a Thermometer within the case covering the deep-sunk Thermometers, whose bulb is placed on a level with their scales, at the same times.

Days of the Month, 1868.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
1	30·3	53·0	S	54·2	62·3	71·6	64·7	76·8	72·7	59·1	S	43·6
2	31·6	S	53·1	56·9	66·2	63·9	72·1	S	73·5	60·0	53·0	48·0
3	29·9	45·9	50·5	58·2	S	66·6	74·2	82·5	75·4	48·2	53·5	51·0
4	30·6	45·4	52·7	58·7	65·1	62·3	64·0	84·6	80·5	S	54·0	53·8
5	S	47·1	54·1	S	58·8	65·9	S	86·0	79·0	61·5	47·0	52·8
6	34·2	46·7	48·3	62·5	57·7	73·5	70·5	73·0	S	58·9	40·0	S
7	32·2	44·1	49·6	60·8	64·3	S	73·8	75·6	84·3	56·6	41·2	51·1
8	32·3	42·2	S	50·6	70·4	62·0	71·4	73·9	70·0	60·0	S	52·4
9	31·3	S	47·7	46·6	71·0	64·9	82·6	S	71·5	59·6	46·5	45·1
10	32·0	47·3	50·4	Good Friday.	S	70·2	79·2	80·9	73·5	61·5	45·1	50·2
11	32·4	47·5	48·5	48·8	64·6	69·5	82·0	72·0	74·7	S	45·0	54·5
12	S	38·6	51·7	S	67·0	71·3	S	72·4	71·0	54·0	45·7	40·2
13	46·3	46·2	53·0	49·5	67·3	79·0	72·7	67·2	S	54·3	45·1	S
14	48·6	46·0	51·4	56·3	64·8	S	79·4	69·4	65·1	56·1	45·1	51·3
15	49·0	45·8	S	57·8	71·5	73·7	84·4	74·5	65·0	58·0	S	53·0

(VI.)—Reading of a Thermometer within the case covering the deep-sunk Thermometers, whose bulb is placed on a level with their scales, at the same times—*concluded.*

Days of the Month, 1868.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
d	°	°	°	°	°	°	°	°	°	°	°	°
16	46·6	*S*	50·7	57·9	68·5	75·5	86·3	*S*	68·5	56·0	40·1	47·1
17	51·6	47·0	48·7	57·0	*S*	78·0	81·8	68·0	68·4	56·2	45·0	49·8
18	46·5	45·9	47·8	51·4	71·3	74·3	81·7	68·5	65·2	*S*	45·6	51·3
19	*S*	45·3	48·8	*S*	82·0	71·1	*S*	68·1	63·8	42·7	45·1	44·9
20	40·8	43·9	46·7	51·3	69·4	82·5	83·9	64·0	*S*	44·8	42·0	*S*
21	40·9	50·3	55·1	59·8	66·9	*S*	86·2	69·5	70·3	52·0	41·6	50·1
22	38·4	48·7	*S*	56·1	64·0	66·3	89·9	64·0	70·5	51·0	*S*	51·2
23	33·5	*S*	48·1	56·1	60·0	68·5	71·7	*S*	62·0	50·6	48·4	43·8
24	35·0	54·0	42·2	53·9	*S*	72·8	73·4	65·2	66·3	49·5	42·5	46·9
25	45·3	56·5	46·7	51·5	65·5	71·9	75·4	63·3	59·1	*S*	44·8	Christmas Day
26	*S*	51·3	45·9	*S*	66·3	73·7	*S*	66·3	66·3	52·9	48·0	44·5
27	39·2	48·6	54·0	60·2	68·0	81·2	84·3	69·5	*S*	48·2	42·0	*S*
28	47·9	54·5	48·0	51·8	73·2	*S*	80·6	65·4	62·0	49·8	40·9	44·9
29	40·5	49·8	*S*	63·5	70·6	72·3	62·8	64·5	64·7	50·9	*S*	45·9
30	44·8		49·8	64·0	69·9	74·5	72·6	*S*	56·6	53·0	42·5	38·1
31	50·6		50·2		*S*		73·7	68·1		57·0		41·2
Means .	39·5	47·7	49·8	55·8	67·2	71·4	76·9	71·3	69·2	54·2	45·2	48·0

WEEKLY MEANS of READINGS of THERMOMETERS.

1868. Period.	Thermometers sunk in the ground. Bulb 24 French Feet deep.	Bulb 12 French Feet deep.	Bulb 6 French Feet deep.	Bulb 3 French Feet deep.	Bulb 1 Inch deep.	Thermometer inclosed in the box which covers the scales of the deep-sunk Thermometers, and placed on a level with their scales.
d d	°	°	°	°	°	°
January 1 to January 7	52·25	49·96	46·55	41·04	34·7	31·5
8 to 14	52·12	49·39	45·40	39·86	37·9	37·2
15 to 21	51·98	48·77	44·93	41·95	44·3	45·9
22 to 28	51·78	48·08	45·04	41·45	39·3	40·7
29 to February 4	51·60	47·75	44·92	41·95	43·7	46·7
February 5 to 11	51·38	47·51	45·27	42·51	43·4	45·8
12 to 18	51·15	47·32	45·23	42·23	42·7	44·9
19 to 25	50·95	47·15	45·21	42·63	45·3	49·8
26 to March 3	50·75	47·00	45·57	44·16	47·4	51·3
March 4 to 10	50·56	46·93	46·16	44·83	46·0	50·5
11 to 17	50·39	46·96	46·36	44·71	47·1	50·7
18 to 24	50·21	47·01	46·62	45·25	45·5	48·1
25 to 31	50·05	47·05	46·74	44·77	44·7	49·1
April 1 to April 7	49·94	47·12	46·87	45·89	49·6	58·5
8 to 14	49·80	47·18	47·54	46·96	47·9	50·4
15 to 21	49·70	47·36	47·88	47·32	50·6	55·9
22 to 28	49·62	47·54	48·58	48·99	51·8	54·9
29 to May 5	49·55	47·78	49·39	50·61	56·0	63·3
May 6 to 12	49·51	48·17	50·63	52·80	56·9	65·8
13 to 19	49·49	48·70	51·88	54·56	61·5	70·9
20 to 26	49·45	49·26	53·11	56·40	61·4	65·3
27 to June 2	49·46	49·94	54·10	57·03	62·2	69·5
June 3 to 9	49·50	50·56	55·04	58·15	61·0	65·9
10 to 16	49·57	51·20	55·79	58·95	64·7	73·2
17 to 23	49·67	51·82	56·90	61·30	66·4	73·4
24 to 30	49·79	52·46	57·95	61·63	65·8	74·4
July 1 to July 7	49·90	53·09	58·73	62·83	65·7	69·9
8 to 14	50·09	53·81	59·51	63·32	69·0	77·9
15 to 21	50·28	54·42	60·38	65·17	73·2	84·0
22 to 28	50·46	55·02	61·48	66·65	72·8	79·2
29 to August 4	50·66	55·66	62·15	66·43	70·0	75·5
August 5 to 11	50·86	56·32	..	67·00	71·4	76·9
12 to 18	51·09	56·80	..	65·78	66·4	70·0
19 to 25	51·30	..	..	64·25	63·0	65·7
26 to September 1	51·54	..	61·76	62·34	62·6	67·7
September 2 to 8	51·83	..	61·38	63·13	67·0	77·1
9 to 15	52·05	..	61·60	63·57	63·7	70·1
16 to 22	52·26	..	61·37	62·09	62·2	67·8
23 to 29	52·45	..	60·78	61·05	59·9	63·4
30 to October 6	52·63	..	60·05	59·07	56·2	57·4
October 7 to 13	..	..	58·95	57·15	56·2	57·7
14 to 20	..	..	57·85	55·59	50·6	52·3
21 to 27	..	..	56·47	52·75	49·0	50·7
28 to November 3	..	56·27	55·13	51·84	50·1	52·9
November 4 to 10	..	55·62	54·25	50·58	44·7	45·6
11 to 17	..	55·03	52·80	48·07	44·6	44·3
18 to 24	..	54·36	51·68	47·42	44·3	44·2
25 to December 1	..	53·66	50·93	46·95	43·9	43·6
December 2 to 8	..	53·07	50·36	47·24	49·5	51·5
9 to 15	..	52·49	50·45	48·22	48·1	49·1
16 to 22	..	52·12	50·28	47·77	47·6	49·1
23 to 31	52·99	51·66	49·48	46·30	43·8	43·6

ABSTRACT OF THE CHANGES OF THE DIRECTION OF THE WIND, AS DERIVED FROM OSLER'S ANEMOMETER.

By *direct* motion, in the following statements, is meant that the change of the direction of the wind was in the order N., E., S., W., N., &c. by *retrograde* is meant in the order N., W., S., E., N., &c.

1867. Dec. $31^{d}.12^{h}$. The direction of the wind was N.N.E.
1868. Jan. 31. 12. ,, ,, S.W., which implies a retrograde motion of 157½°.
On Jan. 4. 22, $6^{d}.22^{h}$, $19^{d}.22^{h}$, $21^{d}.22^{h}$, the trace was shifted to the next set of lines upwards; on Jan. $4^{d}.9^{h}.10^{m}$, $6^{d}.9^{h}$, $11^{d}.22^{h}$, the trace was shifted to the next set of lines downwards, implying retrograde motion of 1440°, and direct motion of 1080°.
Therefore the whole excess of retrograde motion in the month of January was 517½°.

1868. Jan. $31^{d}.12^{h}$. The direction of the wind was S.W.
Feb. 29. 12. ,, ,, W.N.W., which implies a direct motion of 67½°.
Therefore the whole excess of direct motion in the month of February was 67½°.

1868. Feb. $29^{d}.12^{h}$. The direction of the wind was W.N.W.
March 31. 12. ,, ,, N.N.W., which implies a direct motion of 45°.
On March 18. 8. 30^{m}, $30^{d}.22^{h}$, the trace was shifted to the next set of lines downwards, implying direct motion of 720°.
Therefore the whole excess of direct motion in the month of March was 765°.

1868. March $31^{d}.12^{h}$. The direction of the wind was N.N.W.
April 30. 12. ,, ,, W.S.W., which implies a retrograde motion of 90°.
On April 3. 22, $4^{d}.3^{h}$, $17^{d}.4^{h}.30^{m}$, $24^{d}.22^{h}$, the trace was shifted to the next set of lines upwards; on April $4^{d}.22^{h}$, $7^{d}.22^{h}$, $14^{d}.2^{h}.30^{m}$, $14^{d}.22^{h}$, $15^{d}.9^{h}.15^{m}$, $18^{d}.22^{h}$, $26^{d}.7^{h}.30^{m}$, the trace was shifted to the next set of lines downwards, implying retrograde motion of 1440°, and direct motion of 2520°.
Therefore the whole excess of direct motion in the month of April was 990°.

1868. April $30^{d}.12^{h}$. The direction of the wind was W.S.W.
May 31. 12. ,, ,, E.S.E., which implies a direct motion of 225°.
On May 2. 2. 30^{m}, $2^{d}.22^{h}$, $29^{d}.2^{h}.10^{m}$, $29^{d}.2^{h}.30^{m}$, $29^{d}.23^{h}.50^{m}$, the trace was shifted to the next set of lines upwards; on May $8^{d}.9^{h}.30^{m}$, $18^{d}.22^{h}$, $19^{d}.12^{h}$, $29^{d}.22^{h}$, $31^{d}.0^{h}.30^{m}$, the trace was shifted to the next set of lines downwards, implying retrograde motion of 1800°, and direct motion of 1800°.
Therefore the whole excess of direct motion in the month of May was 225°.

1868. May $31^{d}.12^{h}$. The direction of the wind was E.S.E.
June 30. 12. ,, ,, N.N.E., which implies a retrograde motion of 90°.
On June 1. 2. 45^{m}, the trace was shifted to the third set of lines upwards; and on June $8^{d}.22^{h}$, $18^{d}.8^{h}.40^{m}$, $28^{d}.8^{h}$, to the next set of lines upwards; on June $10^{d}.2^{h}.50^{m}$, the trace was shifted to the second set of lines downwards; and on June $1^{d}.22^{h}$, $5^{d}.2^{h}.40^{m}$, $9^{d}.1^{h}$, $12^{d}.22^{h}$, $16^{d}.22^{h}$, $19^{d}.22^{h}$, $20^{d}.2^{h}.50^{m}$, $26^{d}.22^{h}$, $29^{d}.12^{h}$, to the next set of lines downwards, implying retrograde motion of 2160°, and direct motion of 3960°.
Therefore the whole excess of direct motion in the month of June was 1710°.

1868. June $30^{d}.12^{h}$. The direction of the wind was N.N.E.
July 31. 12. ,, ,, N.N.E., which implies no change.
On July 7. 1. 10^{m}, $7^{d}.6^{h}.30^{m}$, $8^{d}.6^{h}$, $8^{d}.21^{h}.15^{m}$, $11^{d}.4^{h}$, $13^{d}.6^{h}.30^{m}$, $21^{d}.22^{h}$, $21^{d}.23^{h}$, $24^{d}.22^{h}$, $27^{d}.2^{h}.45^{m}$, the trace was shifted to the next set of lines upwards; on July $6^{d}.22^{h}$, $7^{d}.9^{h}.45^{m}$, $15^{d}.22^{h}$, $17^{d}.22^{h}$, $19^{d}.22^{h}$, $22^{d}.8^{h}.50^{m}$, $26^{d}.9^{h}.15^{m}$, the trace was shifted to the next set of lines downwards, implying retrograde motion of 3600°, and direct motion of 2520°.
Therefore the whole excess of retrograde motion in the month of July was 1080°.

1868. July $31^{d}. 12^{h}$. The direction of the wind was N.N.E.
Aug. 31. 12. ,, ,, W.S.W., which implies a retrograde motion of 135°.
On Aug. 2. 23, the trace was shifted to the second set of lines upwards, and on Aug. $1^{d}. 1^{h}$, $3^{d}. 22^{h}$, to the next set of lines upwards; on Aug. $1^{d}. 5^{h}. 45^{m}$, $3^{d}. 20^{h}. 50^{m}$, the trace was shifted to the second set of lines downwards; on Aug. $4^{d}. 0^{h}$, $4^{d}. 22^{h}$, $5^{d}. 3^{h}. 30^{m}$, $9^{d}. 22^{h}$, $10^{d}. 3^{h}. 20^{m}$, $10^{d}. 22^{h}$, $19^{d}. 9^{h}$, $21^{d}. 22^{h}$, to the next set of lines downwards, implying retrograde motion of 1440°, and direct motion of 4320°.
Therefore the whole excess of direct motion in the month of August was 2745°.

1868. Aug. $31^{d}. 12^{h}$. The direction of the wind was W.S.W.
Sept. 30. 12. ,, ,, W., which implies a direct motion of $22\frac{1}{2}$°.
On Sept. 9. 9. 30^{m}, $18^{d}. 22^{h}$, $24^{d}. 9^{h}. 30^{m}$, the trace was shifted to the next set of lines upwards; on Sept. $7^{d}. 2^{h}. 50^{m}$, $13^{d}. 3^{h}. 15^{m}$, $18^{d}. 9^{h}$, $26^{d}. 2^{h}. 45^{m}$, $26^{d}. 8^{h}. 45^{m}$, the trace was shifted to the next set of lines downwards, implying retrograde motion of 1080°, and direct motion of 1800°.
Therefore the whole excess of direct motion in the month of September was $742\frac{1}{2}$°.

1868. Sept. $30^{d}. 12^{h}$. The direction of the wind was W.
Oct. 31. 12. ,, ,, S.W., which implies a retrograde motion of 45°.
On Oct. 13. 8. 30^{m}, $14^{d}. 22^{h}$, $25^{d}. 7^{h}. 45^{m}$, the trace was shifted to the next set of lines downwards, implying direct motion of 1080°.
Therefore the whole excess of direct motion in the month of October was 1035°.

1868. Oct. $31^{d}. 12^{h}$. The direction of the wind was S.W.
Nov. 30. 12. ,, ,, S.S.E., which implies a retrograde motion of $67\frac{1}{2}$°.
On Nov. 10. 22, $25^{d}. 22^{h}$, the trace was shifted to the next set of lines upwards; on Nov. $2^{d}. 0^{h}. 15^{m}$, $22^{d}. 8^{h}. 30^{m}$, the trace was shifted to the next set of lines downwards, implying retrograde motion of 720°, and direct motion of 720°.
Therefore the whole excess of retrograde motion in the month of November was $67\frac{1}{2}$°.

1868. Nov. $30^{d}. 12^{h}$. The direction of the wind was S.S.E.
Dec. 31. 12. ,, ,, W.S.W., which implies a direct motion of 90°.
On Dec. 9. 22, $13^{d}. 8^{h}. 45^{m}$, the trace was shifted to the next set of lines downwards, implying direct motion of 720°.
Therefore the whole excess of direct motion in the month of December was 810°.

The whole excess of direct motion to the end of the year was 7425°.

The revolution-counter which is attached to the vertical spindle of the vane, whose readings increase with change of direction of the wind in the order N., E., S., W., &c., or in *direct* motion, and decrease with change of direction in the order N., W., S., E., &c., or in *retrograde* motion, gave the following readings :—

	revs.
On 1867, December $31^{d}. 12^{h}$	83·00
On 1868, December $31^{d}. 12^{h}$	103·35

Implying an excess of direct motion, during the year, of 20·35 revolutions, or 7326°.

AMOUNT OF RAIN COLLECTED IN EACH MONTH OF THE YEAR 1868.

1868, MONTH.	Monthly Amount of Rain collected in each Gauge.						
	Self-registering Gauge of Osler's Anemometer.	Second Gauge at Osler's Anemometer.	On the Roof of the Octagon Room.	On the Roof of the Library.	On the Roof of the Photographic Thermometer Shed.	Crosley's.	Cylinder partly sunk in the Ground read daily.
	in.	in.	in.	in.	in.	in.	in.
January	2·14	2·07	2·89	2·78	3·54	3·48	4·19
February	0·60	0·53	0·77	0·55	1·01	1·09	1·28
March	0·27	0·25	0·54	0·42	0·80	0·91	1·07
April	0·98	0·93	1·15	1·05	1·61	1·60	2·08
May	1·08	1·21	1·34	1·18	1·41	1·27	1·67
June	0·34	0·33	0·44	0·35	0·46	0·45	0·47
July	0·58	0·62	0·73	0·74	0·90	0·88	1·06
August	1·40	1·56	2·09	1·99	2·32	2·20	2·61
September	0·81	0·81	1·15	1·09	1·27	1·20	1·52
October	1·20	1·24	1·78	1·72	2·16	2·07	2·59
November	0·36	0·36	0·57	0·51	0·83	0·85	1·16
December	3·15	3·13	3·77	3·21	4·35	4·25	5·45
Sums	12·91	13·04	17·22	15·59	20·66	20·25	25·15

The heights of the receiving surfaces are as follows:

	Above the Mean Level of the Sea. Ft.	In.	Above the Ground. Ft.	In.
The Two Gauges at Osler's Anemometer	205	6	50	8
Gauge on the Roof of the Octagon Room	193	2½	38	4½
Gauge on the Roof of the Library	177	2	22	4
Gauge on the Roof of the Photographic Thermometer Shed	164	10	10	0
Crosley's Gauge	156	6	1	8
The Cylinder Gauge partly sunk in the Ground	155	3	0	5

ROYAL OBSERVATORY, GREENWICH.

OBSERVATIONS

OF

LUMINOUS METEORS.

1868.

Month and Day, 1868.		Greenwich Mean Solar Time.	Observer.	Apparent Size of Meteor in Star-Magnitudes.	Colour of Meteor.	Duration of Meteor in Seconds of Time.	Appearance and Duration of Train.	Length of Meteor's Path in Degrees.	Number for Reference.
		h m s						°	
February	15	11. 0. 0	W.	2	Bluish-white	1	None	8	1
February	17	7. 54. 0	W.	1	Bluish-white	1	None	15	2
March	10	10. 13. 45	W.	Jupiter	Yellowish	2	Train	30	3
March	31	11. 15. 0	F.	3 increasing	Blue	0·5	None	5	4
April	20	9. 17. 16	N.	> 1	Blue	2	Fine, 2ˢ	20	5
	„	10. 25. 24	N.	1	Blue	1	. . .	10	6
	„	11. 22. 44	N.	1	Blue	1	Train	10	7
	„	11. 35. 38	N., T.	Venus	Bluish-white	2	Fine	25	8
	„	11. 51. 0	N.	> 1	Bluish-white	1	Train	25	9
April	21	8. 4. 41	N.	> 1	Blue	2	Train	20	10
	„	11. 6. 0	W.	3	Bluish-white	0·5	None	5	11
April	23	9. 0. 8	N.	1	Bluish-white	< 1	Train	..	12
May	1	9. 25. 0	F.	1	Reddish	1·5	Train, 1ˢ·5	20	13
May	8	9. 10. 0	F.	3	Bluish-white	0·5	None	4	14
May	15	10. 21. 0	F.	1	Bluish-white	0·5	Train	12	15
May	17	10. 32. 0	N.	< Venus	Bluish-white	1·5	Train	15	16
May	18	10. 21. 8	W.	1	Bluish-white	5	Train	40	17
	„	10. 34. 7	F.	1	Blue	1	Train	20	18
	„	10. 40. 0	N.	6	. . .	0·3	None	4	19
	„	10. 51. 50	N.	3	Bluish-white	0·7	None	9	20
	„	11. 5. 20	N.	4	Bluish-white	0·5	None	6	21
	„	11. 7. 10	S.	2	Bluish-white	1	None	..	22
	„	11. 11. 13	W.	2	Bluish-white	1	Train	10	23
	„	11. 18. 27	T.	. . .	Bluish-white	0·5	None	..	24
	„	11. 32. 5	N.	3	Bluish-white	0·4	None	6	25
	„	11. 39. 17	N.	3	Bluish-white	0·6	None	5	26
	„	11. 47. 27	S.	1	Bluish-white	0·5	Small	..	27
	„	11. 59. 28	S.	2	Bluish-white	0·5	None	..	28
	„	12. 6. 30	N.	3	Bluish-white	0·8	None	8	29
	„	12. 7. 5	F.	1	Bluish	0·5	None	7	30
	„	12. 11. 35	T.	. . .	Bluish-white	0·5	None	..	31
	„	12. 13. 57	S.	2	Bluish-white	3	None	..	32
	„	12. 19. 36	T.	. . .	Bluish	0·5	Train	..	33
	„	12. 20. 35	S.	2	Bluish-white	0·5	None	..	34
	„	12. 38. 35	S.	2	Bluish-white	0·5	None	..	35
	„	13. 7. 49	N.	1	Bluish-white	1	Train	12	36
May	19	10. 4. 3	S.	2	Bluish-white	1	Small	..	37
	„	10. 13. 21	W., S.	3	Bluish-white	1	None	36	38
	„	11. 8. 22	N.	1	Bluish-white	1	Train	15	39
	„	12. 3. 3	N.	> 1	Yellowish-white	2	Train	..	40
May	20	10. 24. 0	F.	1	Bluish	0·5	Fine	20	41
	„	10. 48. 0	F.	> 1	Blue	0·8	Fine	40	42
May	25	11. 57. 30	N.	2	Blue	0·5	None	6	43
	„	12. 8. 0	N.	2	Blue	0·6	None	8	44
June	7	9. 57. 50	W.	> 1	Yellowish	5·0	Train	..	45

Number for Reference.	Path of Meteor through the Stars.
1	Passed about 3° above Procyon towards *m* Monocerotis.
2	From direction of θ Canis Majoris passed about 4° North of Sirius towards β Canis Majoris.
3	From the direction of η Boötis towards γ Corvi.
4	Commenced about 2° below Arcturus (*i.e.* towards East horizon), and fell perpendicularly.
5	From direction of β Cephei to λ Persei.
6	From θ Coronæ passed between ε Boötis and Arcturus.
7	Passed across Coma Berenices from direction of γ Boötis.
8	From a point slightly above Polaris fell at inclination 45°, in the direction of a point perpendicularly below β Ursæ Majoris.
9	From direction of α Ursæ Majoris fell with inclination of 7° to right.
10	Directed from η Ursæ Majoris fell on a line produced from joining line of ζ and η Ursæ Majoris. Center of path opposite Arcturus, about 10° below.
11	From β to κ Lyræ.
12	Latter part of path seen only: disappearing midway between γ and β Cephei, moving towards β Cassiopeiæ.
13	Passed with inclination of 45° about 8° on the left of Pollux, moving towards horizon.
14	Passed 3° below Castor and Pollux, moving parallel to line joining those stars.
15	Passed a little above Saturn towards West horizon.
16	From direction of ζ Ursæ Majoris passed nearly vertically across δ and θ Leonis.
17	From the direction of χ Herculis fell towards α Herculis.
18	Commenced its flight about 5° from α Ursæ Majoris, moved towards Cassiopeia.
19	Seen through 30-inch Achromatic telescope, passing about 1° above Saturn from direction of β Libræ.
20	Across μ to ι Libræ.
21	From direction of ε Virginis to γ Virginis.
22	Fell vertically from α Lyræ, passing close to β Cygni.
23	From ε Herculis towards α Herculis.
24	From γ Ursæ Majoris to 2° before β Ursæ Majoris.
25	From near γ Libræ passed across α Libræ.
26	From θ Scorpii disappeared about 1° West of δ Scorpii.
27	From α Lyræ in a curved line to η Lyræ, passing close to δ Lyræ.
28	From η Ursæ Majoris to χ Ursæ Majoris.
29	Directed from ζ Aquilæ disappeared near λ Aquilæ.
30	From about 4° to West and above Polaris.
31	Appeared about 2° above ζ Ursæ Majoris and disappeared 5° beyond that star.
32	From χ Boötis moved towards χ Ursæ Majoris.
33	From β Ursæ Minoris disappeared about 3° beyond η Ursæ Majoris.
34	From ν Boötis to α Draconis.
35	From S Boötis to χ Boötis.
36	Directed from Polaris disappeared near λ Ursæ Majoris.
37	From a point a little to left of γ Lyræ passed midway between δ and β Sagittæ.
38	From direction of τ Boötis towards λ Serpentis.
39	Across *p* Lyncis from direction of θ Ursæ Majoris.
40	From direction of γ Sagittæ fell midway between α Aquilæ and Delphinus.
41	From near β Ursæ Minoris towards α Cassiopeiæ.
42	From near α Ursæ Majoris towards Venus.
43	From direction of γ Ursæ Majoris passed between λ and μ Ursæ Majoris.
44	Moved on a line parallel to υ and ο Ursæ Majoris, from a point near θ Ursæ Majoris.
45	From about 5° above θ Libræ passed above κ Virginis towards γ Virginis.

Month and Day, 1868.		Greenwich Mean Solar Time.	Observer.	Apparent Size of Meteor in Star-Magnitudes.	Colour of Meteor.	Duration of Meteor in Seconds of Time.	Appearance and Duration of Train.	Length of Meteor's Path in Degrees.	Number for Reference.
		h m s						°	
July	25	9. 32. 0	W.	1	Bluish	1	Fine	30	1
July	27	11. 36. 30	W.	1	Yellowish	2	Train	10	2
July	30	11. 14. 25	N.	1	Blue	0·5	. . .	5	3
„		11. 27. 42	N.	> 1	Bluish-white	0·8	Train	10	4
August	7	9. 13. 0	W., S.	1	Bluish-white	1	Train	7	5
„		10. 25. 21	N., F.	2	Bluish-white	0·4	. . .	5	6
„		11. 5. 46	N., F.	1	Blue	0·8	Train	..	7
„		11. 23. 9	N.	Jupiter	Bluish-white	1	Fine, > 1 ^{s}.	15	8
„		11. 36. 21	S.	1	Bluish-white	1	None	10	9
„		11. 45. 47	N.,W.,S.	1	Bluish-white	0·7	Train	12	10
„		11. 50. 46	N., W.	1	Bluish-white	0·6	Slight	10	11
„		11. 54. 4	N.	4	Bluish-white	0·3	None	5	12
„		11. 54. 9	N.	1	Blue	0·7	Train	12	13
„		11. 54. 21	S.	1	Bluish-white	. . .	Slight	8	14
„		12. 12. 4	N.	Jupiter	Bluish-white	1·5	Fine, 2 ^{s}.	8	15
„		12. 12. 44	N.	2	Bluish-white	0·7	Train	12	16
August	8	10. 29. 35	N.,W.,S.	1	Bluish-white	0·8	None	5	17
„		10. 45. 58	W.	1	Bluish-white	1	None	10	18
„		10. 49. 48	G.	1	Bluish-white	. . .	None	20	19
„		10. 57. 40	T., W.	1	Bluish-white	1	Slight	15	20
„		10. 58. 36	W.	3	Bluish-white	0·5	None	5	21
„		11. 9. 2	W.	1	Bluish-white	1	None	10	22
„		11. 11. 10	N.,W.,S.	Jupiter	Bluish-white	1·5	Fine, 2 ^{s}.	30	23
„		11. 13. 0	G.	2	Bluish-white	2	None	..	24
„		11. 27. 43	T., W.	Jupiter	Yellowish	0·5	Train	30	25
„		11. 39. 23	W.	1	Bluish-white	1	Train	30	26
„		11. 46. 26	W.	1	Bluish-white	1	Train	15	27
„		11. 46. 28	N.,T.,W.	2	Bluish-white	0·7	Train	10	28
„		12. 8. 23	S.	2	Bluish-white	0·5	None	12	29
„		12. 16. 48	N.	1	Bluish-white	0·9	Train	15	30
„		12. 37. 48	W.	1	Bluish-white	1	Train	20	31
„		12. 41. 50	N.	2	Blue	0·5	Train	7	32
„		12. 46. 30	S.	1	Bluish-white	1·5	. . .	25	33
„		12. 52. 33	N.	2	Bluish-white	0·4	Train	6	34
„		12. 53. 33	W., S.	1	Bluish-white	1	None	10	35
„		12. 58. 8	W., S.	2	Bluish-white	0·7	. . .	16	36
„		13. 1. 4	S.	2	Bluish-white	2	None	..	37
„		13. 7. 53	S.	1	Bluish-white	0·7	None	..	38
August	10	9. 10. 44	S.	1	Bluish-white	0·7	Slight	..	39
„		9. 28. 4	S.	1	Bluish-white	1	Train, 2 ^{s}.	..	40
„		9. 36. 6	S.	1	Bluish-white	1	. . .	..	41
„		9. 38. 0	F.	1	Blue	1	Fine	..	42
„		9. 43. 0	F.	2	Blue	0·5	Train	10	43
„		9. 44. 0	F.	2	Blue	0·5	Train	10	44
„		9. 44. 46	S.	2	Blue	1	Slight	..	45
„		9. 49. 6	S.	1	Blue	0·7	Train	..	46
„		9. 51. 43	N.	2	Bluish-white	0·6	None	7	47
„		9. 52. 4	S.	2	Bluish-white	0·5	Train, 1 ^{s}.	..	48
„		9. 55. 8	N.	3	Bluish-white	0·5	None	5	49
„		10. 3. 22	S.	1	Bluish-white	1	Short	..	50
„		10. 7. 26	I.	2	Bluish-white	0·5	. . .	..	51
„		10. 8. 47	S.	2	Bluish-white	Short	Slight	..	52
„		10. 11. 52	N.	1	Bluish-white	0·6	Train	5	53
„		10. 14. 44	I.	1	Bluish-white	0·5	Train	..	54
„		10. 16. 0	G.	1	Yellow	. . .	Bril., tapering, 3 ^{s}.	..	55
„		10. 21. 53	N., S.	> 1	Bluish-white	1	Slight	12	56

Number for Reference.	Path of Meteor through the Stars.
1	From δ Serpentis passed δ and ε Ophiuchi towards η Ophiuchi.
2	Fell from δ Andromedæ towards η Piscium.
3	Fell perpendicularly in North from a point 10° West of β Aurigæ.
4	Directed from ε Cassiopeiæ, disappeared near Capella.
5	From direction of ο Ursæ Majoris passed just above μ Ursæ Majoris towards horizon.
6	Passed across ζ Ursæ Majoris towards horizon, nearly at right angles to joining-line of ζ and ε Ursæ Majoris.
7	From direction of ε Cassiopeiæ moved towards α Ursæ Majoris : center of track opposite Polaris.
8	Fell nearly vertically in S.W., from a point near θ Serpentis fell parallel to line joining β Cygni and ε Aquilæ.
9	From a point between α and β Ursæ Minoris passed between λ and κ Draconis, and disappeared between α and δ Ursæ Majoris.
10	Directed from κ Cephei towards β Draconis.
11	Passed midway between α Lyræ and δ Cygni, across β Cygni.
12	From γ Draconis towards α Lyræ.
13	Fell a few degrees to left of α Aquilæ, across θ Aquilæ.
14	From a point right of α Cygni, passed to β Aquilæ.
15	From direction of η Pegasi disappeared near ζ Cygni.
16	Directed from α Lyræ, disappeared at α Herculis.
17	Passed about 1° above α Ursæ Majoris, moving towards γ Ursæ Majoris.
18	From direction of η Ursæ Majoris moved towards η Boötis.
19	Passed about 1° above α Ursæ Majoris, moving towards a point ⅓rd from γ measuring towards δ Ursæ Majoris.
20	From direction of ζ Herculis towards β Cygni.
21	Passed just above ν Draconis towards ζ Draconis.
22	From a point 3° to right of β Cassiopeiæ passed α Cassiopeiæ towards γ Andromedæ.
23	Passed almost vertically between α Aquilæ and Taurus Poniatowski from direction of γ Cygni, moving towards η Serpentis.
24	From point 14° below and left of Polaris to ζ Ursæ Majoris.
25	From direction of α Cephei towards β Ophiuchi.
26	From direction of β Cassiopeiæ moved towards β Ursæ Minoris, passing just above γ Cephei.
27	From direction of δ Cygni towards δ Herculis.
28	Directed from β Ursæ Minoris, moved on a line parallel to joining-line of β and α Ursæ Minoris.
29	From between δ and ε Cassiopeiæ passed across β Cephei.
30	From direction of Honores passed midway between ε Pegasi and Delphinus.
31	From direction of α Cassiopeiæ towards η Pegasi.
32	From near γ Draconis fell towards δ Herculis.
33	Passed a few degrees below B Herculis, and by ζ Lyræ.
34	From direction of γ Draconis passed between δ and ζ Herculis.
35	From ο Herculis to δ Herculis.
36	From θ to F Herculis.
37	From o Honorum to ε Delphini.
38	Appeared a few degrees left of γ Cephei, disappeared close to M Camelopardali.
39	From a point a few degrees right of α Lyræ passed midway between γ and β Lyræ to ζ Aquilæ.
40	From η Draconis passed between γ Serpentis and γ Herculis.
41	From a point close to θ Boötis, disappeared close to ε Boötis.
42	From near η Ursæ Majoris to η Boötis.
43	From a point 12° from Polaris moved towards α Draconis.
44	Moved towards ε Ursæ Majoris from direction of Polaris.
45	From midway between ζ and β Draconis to midway between α and β Herculis.
46	From γ Cygni passed close to γ Sagittæ.
47	From direction of γ Andromedæ passed across γ Pegasi at right angles to line joining γ and β Pegasi.
48	From β Cassiopeiæ to o Honorum.
49	Started near α Trianguli, moved towards S. horizon parallel to line joining α and β Trianguli.
50	From a point near α Lyræ to ε Delphini.
51	From Polaris towards a point between δ and γ Ursæ Majoris.
52	From M Camelopardali passed about 2° from α towards γ Ursæ Majoris.
53	Directed from η Persei : center of path about 2° below γ Trianguli.
54	From Polaris passed β Ursæ Minoris, disappearing a short distance beyond.
55	Passed across η Ursæ Majoris from a point nearly midway between that star and a point 5° below Polaris.
56	Passed through Delphinus to θ Aquilæ.

Month and Day, 1868.		Greenwich Mean Solar Time.	Observer.	Apparent Size of Meteor in Star-Magnitudes.	Colour of Meteor.	Duration of Meteor in Seconds of Time.	Appearance and Duration of Train.	Length of Meteor's Path in Degrees.	Number for Reference.
		h m s						°	
August	10	10. 21. 53	N.	2	Bluish-white	0·5	Train	5	1
„		10. 23. 54	S.	2	. . .	0·5	Short	. .	2
„		10. 28. 26	W.	3	Bluish-white	0·5	None	. .	3
„		10. 33. 53	W.	2	Bluish-white	0·5	None	Short	4
„		10. 36. 4	S.	2	Bluish-white	0·5	Slight	. .	5
„		10. 37. 54	N.	2	Bluish-white	0·3	None	4	6
„		10. 41. 6	F., S., I.	Jupiter	Bluish-white	. . .	Fine	25	7
August	11	11. 31. 0	S.	3	Bluish-white	0·5	None	. .	8
„		11. 37. 0	S.	2	Bluish-white	0·5	None	. .	9
„		11. 42. 0	S.	1	Bluish-white	0·5	None	. .	10
„		11. 58. 0	T.	1	Bluish-white	0·5	None	15	11
August	12	9. 22. 15	S.	2	Bluish-white	0·5	None	8	12
„		10. 2. 15	S.	Jupiter	Bluish-white	2·0	Splendid	30	13
„		10. 7. 25	W., S.	1	Bluish-white	1·5	Train	12	14
„		10. 11. 10	W.	1	Yellowish	1	None	10	15
„		11. 18. 45	W.	1	Bluish-white	0·5	None	5	16
„		11. 28. 15	W.	2	Bluish-white	1	None	10	17
„		11. 32. 10	W.	2	Bluish-white	1	None	< 1	18
„		11. 39. 39	W.	2	Yellowish	1	None	8	19
„		11. 43. 15	W.	1	Bluish-white	0·5	None	7	20
„		11. 46. 50	W.	1	Bluish-white	1	None	15	21
„		11. 46. 55	W.	3	Bluish-white	0·4	None	> 10	22
August	13	9. 36. 24	S.	2	Blue	0·7	Slight	3	23
„		9. 47. 39	S.	2	Blue	1	None	8	24
„		9. 52. 41	N.	1	Bluish-white	1·3	Train	12	25
„		9. 53. 11	N.	3	Bluish-white	0·6	None	7	26
„		9. 59. 8	N.	1	Bluish-white	1·5	Train	15	27
„		10. 25. 53	N.	1	Bluish-white	0·9	Train	7	28
„		10. 38. 55	N.	1	Bluish-white	1	Train	. .	29
„		10. 41. 6	N.	> 1	Bluish-white	> 1	Train	15	30
„		11. 29. 36	N.	2	Bluish-white	0·5	Train	6	31
„		11. 35. 23	N.	1	Bluish-white	1·3	Train	10	32
„		11. 35. 39	N.	2	Bluish-white	0·5	None	7	33
August	15	11. 45. 16	N.	> 1	Bluish-white	2	Fine	30	34
October	7	11. 54. 45	N.	1	Bluish-white	0·8	Train	12	35
October	9	8. 17. 30	W.	2	Bluish-white	0·5	None	5	36
„		8. 17. 30	W.	2	Bluish-white	0·5	None	5	37
„		8. 45. 0	W.	1	Bluish-white	1·5	Train	20	38
„		9. 21. 15	W., S.	Jupiter	Yellowish	4	Red	35	39
October	14	7. 7. 58	N.	2	Bluish-white	1·5	. . .	18	40
October	16	9. 37. 35	S.	2	Bluish-white	0·5	None	. .	41
„		9. 44. 32	N.	5	White	0·4	None	4	42
„		9. 54. 9	N.	2	White	0·7	None	8	43
„		10. 4. 13	N., W.	1	Bluish-white	1·2	Train	8	44
„		10. 5. 21	N.	1	Bluish-white	1·5	Fine	30	45
„		10. 18. 19	N.	2	Bluish-white	0·6	None	8	46
„		10. 24. 32	N., S.	2	Bluish-white	1	None	. .	47
„		10. 28. 31	S.	4	Bluish-white	. . .	. . .	. .	48
„		10. 30. 12	W.	1	Bluish-white	1	Train	20	49
„		10. 33. 44	N., S.	> 1	Bluish-white	1·5	Train, 1s.	25	50
„		10. 35. 24	W.	4	Bluish-white	0·5	None	15	51
„		10. 36. 1	S.	1	. . .	1·5	Fine	. .	52
„		10. 53. 39	N.,W.,S.	> 1	Yellowish	. . .	Fine	40	53

Number for Reference.	Path of Meteor through the Stars.
1	Directed from Lacerta, passed between α and γ Cassiopeiæ, parallel to β and γ Cassiopeiæ.
2	From between β and η Pegasi to ε Pegasi.
3	From direction of α Cephei towards κ Cephei.
4	From direction of ε Cassiopeiæ passed midway between π and γ Cephei.
5	From direction of a point between γ and β Ursæ Minoris disappeared a little before β Coronæ Borealis.
6	Passed close to α Persei, at right angles to line joining α and δ Persei, moving towards β Persei.
7	From direction of β Cassiopeiæ towards α Aquilæ.
8	From β Pegasi to θ Pegasi.
9	From between ζ and ε Cygni passed between α and θ Aquilæ.
10	From between ζ and ε Cygni passed close to θ Aquilæ.
11	From ε Cassiopeiæ towards κ Cephei.
12	From a point a few degrees to the right of α Cygni passed close to β Cygni.
13	Started close to ε Cassiopeiæ, passing a few degrees to the right of α Cygni to λ Aquilæ.
14	From the direction of β Cassiopeiæ passed above τ Pegasi towards ζ Pegasi.
15	From a point about 3° above τ Pegasi towards ξ Pegasi.
16	Moved on a path parallel to a line joining δ and ζ Piscium and 5° below those stars.
17	From the direction of β Persei passed midway between *d* and *c* Muscæ.
18	Almost stationary at a point situated nearly centrally between η, τ, γ, and *k* Persei.
19	From a point about 1° above ε Persei towards ζ Persei.
20	From δ to ζ Cassiopeiæ.
21	From the direction of α Cassiopeiæ towards β Pegasi.
22	Almost identical with the meteor at 11^h. 46^m. 50^s.
23	From midway between δ Ursæ Minoris and *r* Custodis disappeared between *r* and *f* Custodis.
24	From ζ Cephei towards *n* Tarandi.
25	Passed between ζ and δ Sagittarii from direction of λ Aquilæ.
26	From ε Aquarii to α Capricorni.
27	From direction of ε Pegasi disappeared near γ Piscium.
28	Directed from η Pegasi passed about 2° from γ Pegasi (center of path opposite that star) towards Jupiter.
29	From direction of β Boötis disappeared close to ρ Boötis (between ρ and ε Boötis).
30	From direction of α Ophiuchi disappeared midway between ζ and ε Ophiuchi.
31	From direction of β towards δ Cassiopeiæ.
32	Passed across ξ Cygni from direction of η Pegasi, and disappeared 2° above and left of α Cygni.
33	Directed from κ Pegasi passed across ε Pegasi.
34	From direction of β Lyræ disappeared near α Ophiuchi.
35	From direction of ζ Pegasi moved towards β Cygni.
36	From direction of θ Draconis towards ζ Herculis.
37	From direction of β Cygni passed about 2° below ζ Herculis.
38	Directed from α Lyræ passed 3° South of α Herculis.
39	From direction of γ Persei to ο Ursæ Majoris.
40	From direction of α Cygni passed across α Andromedæ and 1° farther.
41	From a point a few degrees right of δ Aurigæ to a point a few degrees left of β Aurigæ.
42	Directed from α Trianguli passed about 1° above β Trianguli.
43	Disappeared midway between α and γ Cygni : point of appearance not noted.
44	From direction of γ Pegasi passed between δ and ε Piscium.
45	From near Honores passed across ε Cygni and 5° beyond.
46	Passed between β and γ Draconis and across ζ Herculis, moving from direction of Polaris.
47	From d_2 Camelopardali to α Ursæ Majoris.
48	Moved from between *c* and *b* Persei to within a few degrees of α Cygni.
49	From direction of δ Ursæ Minoris, to a point close to υ Ursæ Majoris.
50	From α Cassiopeiæ passed across ε Cygni.
51	From direction of *a* Muscæ towards δ Piscium.
52	From between γ and η Persei passed close to δ Piscium and a few degrees beyond.
53	From α Tauri towards μ Piscium.

Month and Day, 1868.		Greenwich Mean Solar Time.	Observer.	Apparent Size of Meteor in Star-Magnitudes.	Colour of Meteor.	Duration of Meteor in Seconds of Time.	Appearance and Duration of Train.	Length of Meteor's Path in Degrees.	Number for Reference.
		h m s						°	
October	16	10. 57. 7	N.	1	Bluish-white	< 1	Train	..	1
"		10. 57. 7	S.	3	Bluish-white	0·5	. . .	..	2
"		11. 0. 31	N., W.	Jupiter	Bluish-white	1·5	Very fine	..	3
"		11. 2. 0	W.	3	Bluish-white	1	None	6	4
"		11. 7. 44	W.	3	Bluish-white	0·5	None	4	5
October	17	10. 12. 31	N.	1	White	0·7	None	13	6
"		10. 20. 9	N.	3	White	0·5	None	..	7
October	18	11. 33. 30	W.	> 1	Bluish-white	1·5	Fine	..	8
"		11. 45. 0	W.	3	Bluish-white	0·5	None	5	9
October	21	10. 3. 33	N.	4	White	0·5	None	10	10
October	22	9. 21. 0	S.	1	Bluish-white	. . .	Slight	..	11
"		9. 32. 48	S.	3	Bluish-white	. . .	Slight	..	12
"		9. 54. 37	S.	1	Bluish-white	2	None	..	13
"		10. 12. 0	F.	3	Bluish	0·5	Slight	..	14
"		10. 24. 0	F.	2	Bluish	0·5	Short	10	15
"		10. 36. 0	F.	3	Bluish	0·5	Train	..	16
November	5	10. 17. 0	W.	1	Bluish-white	1	None	20	17
"		10. 19. 0	W., S.	Jupiter	Yellowish	1·5	Fine	15	18
"		10. 47. 30	S.	> Jupiter	. . .	. . .	None	..	19
November	13	13. 57. 5	N.	1	Blue	1	Train	12	20
"		13. 58. 0	F.	1	Blue	0·5	Fine	32	21
"		13. 58. 22	N.	> Jupiter	Blue	1·5	Very fine, 2^s.	..	22
"		14. 4. 5	F.	1	Blue	0·5	Fine; blue	20	23
"		14. 4. 40	N., S.	> 1	Bluish-white	. . .	Fine	..	24
"		14. 6. 33	N., S.	2	Bluish-white	0·6	Fine	10	25
"		14. 9. 10	S.	1	Bluish-white	. . .	Fine	30	26
"		14. 9. 50	N.	1	Blue	1	Fine	15	27
"		14. 11. 45	S.	1	Bluish-white	. . .	Blue	40	28
"		14. 12. 35	F.	1	Bluish	0·5	Blue	..	29
"		14. 13. 9	S.	1	Blue	1	Fine	..	30
"		14. 14. 1	S.	1	Blue	1	Fine	..	31
"		14. 14. 26	N.	Jupiter	Blue	1·5	Fine	..	32
"		14. 15. 13	S.	1	Blue	Momentary	. . .	Stationary	33
"		14. 15. 18	N., S.	Jupiter	Bright green	0·5	Red	5	34
"		14. 17. 30	F.	1	Bluish	0·5	Bright	10	35
"		14. 21. 50	F.	1	Bluish	0·5	Fine	16	36
"		14. 23. 35	N.	1	Blue	1·5	Fine	25	37
"		14. 24. 8	F.	1	Blue	0·5	Fine	20	38
"		14. 24. 10	S.	1	Bluish-white	. . .	Green	..	39
"		14. 25. 38	F.	1	Bluish	0·5	Fine	16	40
"		14. 27. 55	S.	1	Bluish-white	. . .	Fine	..	41
"		14. 28. 26	N.	3	Blue	0·5	None	2	42
"		14. 29. 3	F.	1	Bluish	0·5	Fine	..	43
"		14. 30. 36	F.	1	Bluish	0·5	. . .	..	44
"		14. 32. 40	N.	Jupiter	Blue	1·5	Fine, 2^s.	25	45
"		14. 35. 10	F.	1	Bluish	0·5	. . .	25	46
"		14. 35. 20	S.	1	Blue	. . .	Fine	..	47
"		14. 35. 30	N.	> 1	Blue	0·8	Train	..	48
"		14. 36. 57	N.	1	Blue	1	Train	10	49
"		14. 36. 58	N.	1	Blue	0·6	Train	4	50
"		14. 37. 36	N., S.	1	Green	1	Green	..	51
"		14. 39. 10	S.	1	Bluish-white	. . .	. . .	..	52
"		14. 39. 20	F.	1	Bluish	0·5	. . .	..	53
"		14. 40. 55	F.	1	Bluish	. . .	. . .	..	54
"		14. 42. 10	F., S.	Jupiter	Bluish-white	. . .	Fine	..	55

* November 13. The sky was overcast till $13^h. 57^m$.

Number for Reference.	Path of Meteor through the Stars.
1	From direction of θ Ursæ Majoris passed 3° below γ Ursæ Majoris.
2	From β Aurigæ to within a few degrees of β Ursæ Minoris.
3	From φ Andromedæ passed across Honores and 1° North of μ Cygni to a point 5° beyond the latter star.
4	Pursued a path in continuation of line joining θ Draconis and k Quadrantis.
5	From a point 3° to right of α Ursæ Majoris to a point 4° right of β Ursæ Majoris.
6	Across the Pleiades towards α Ceti. (Sky very hazy.)
7	Across Aries towards Jupiter. Haze and fog.)
8	From a point about 4° above α Tauri shot towards α Piscium.
9	From direction of α Cassiopeiæ passed 2° West of β Trianguli.
10	From direction of θ Cygni passed midway between α Lyræ and γ Draconis.
11	From Polaris to β Ursæ Minoris.
12	From direction of β Cassiopeiæ towards α Pegasi.
13	From o Ursæ Majoris to θ Geminorum.
14	From below λ Persei towards the Pleiades (within 3° and below).
15	From near λ Persei towards γ Persei.
16	From direction of Perseus to a point midway between α and β Ursæ Majoris.
17	From direction of γ Ursæ Minoris, passed about 1° above θ Ursæ Majoris.
18	From direction of δ Draconis towards β Draconis.
19	From α Persei towards δ Geminorum.
20	From direction of α Ursæ Majoris passed across β Ursæ Minoris.
21	From a little below η Ursæ Majoris towards Northern horizon.
22	From direction of Polaris passed across β Draconis.
23	From a point about 2° from Polaris (*i.e.* towards δ Ursæ Minoris) moved towards α Cephei.
24	From direction of Cassiopeiæ towards North-West.
25	From β Arietis towards Jupiter.
26	From direction of Polaris towards horizon at an angle of inclination from vertical of 5°.
27	From direction of Mars disappeared about 5° below η Ursæ Majoris.
28	From direction of α Persei to Jupiter.
29	From near η Cassiopeiæ fell almost perpendicularly towards horizon.
30	Directed from ζ Ursæ Majoris towards North horizon (inclination to left, 45°).
31	Path almost the same as that of preceding meteor.
32	From point between ϵ and ζ Ursæ Majoris passed between ι Draconis and γ Ursæ Minoris.
33	Burst with bright blue light very near α Leonis. A nebulous light left for some time after the bursting of the meteor.
34	From near ϵ Leonis to r Lyncis.
35	From near λ Ursæ Majoris to within 1° of α Ursæ Majoris.
36	From a point about 5° from Polaris towards γ Cassiopeiæ.
37	From α Geminorum passed between α and δ Orionis.
38	From near Polaris to β Draconis.
39	From Capella to α Arietis.
40	From near γ Ursæ Minoris to a point between α and η Cephei.
41	From a few degrees to West of Polaris fell with inclination to left of 45° towards North horizon.
42	From γ Leonis towards ρ Leonis.
43	From near ζ Cephei towards horizon. Its path produced backwards through ζ Cephei would pass about 7° below γ Ursæ Minoris.
44	Started from a point midway between Polaris and β Cephei and disappeared near δ Cephei.
45	Passed across κ Orionis and 5° beyond ; moving from direction of Procyon.
46	From near Pollux towards Aldebaran.
47	From direction of κ Ursæ Majoris towards γ Cassiopeiæ.
48	From μ Leonis towards ι Ursæ Majoris.
49	From Mars towards α Hydræ.
50	Passed close to α Hydræ, from direction of Mars.
51	From β Aurigæ towards a point a few degrees North of α Arietis.
52	Appeared about 20° above horizon, moving with inclination of 45° towards horizon, from direction of Rigel.
53	From a point 10° from Procyon towards Rigel.
54	From a point 8° from Rigel towards Pleiades.
55	From ϵ Leonis passed close to γ Geminorum.

Month and Day, 1868.		Greenwich Mean Solar Time.	Observer.	Apparent Size of Meteor in Star-Magnitudes.	Colour of Meteor.	Duration of Meteor in Seconds of Time.	Appearance and Duration of Train.	Length of Meteor's Path in Degrees.	Number for Reference.
		h m s						°	
November	13	14. 42. 53	N.	Mars	Blue	0·8	Train	8	1
"		14. 43. 22	F.	1	Blue	. . .	. . .	..	2
"		14. 44. 40	F.	1	Blue	. . .	. . .	..	3
"		14. 45. 55	N., F., S.	> Jupiter	Fine deep blue	> 2	Very fine, > 1^{m}.	20	4
"		14. 46. 20	S.	> Jupiter	Blue	. . .	Train, 10^{s}.	..	5
"		14. 50. 43	S.	2	Bluish-white	. . .	Fine	..	6
"		14. 52. 7	S.	Jupiter	Bluish-white	. . .	. . .	..	7
"		14. 58. 38	N.	> 1	Blue	0·8	Train	..	8
"		16. 2. 54*	N.	> 1	Blue	1	Train	12	9
"		16. 3. 32	S.	1	Bluish-white	. . .	Fine	..	10
"		16. 6. 10	F.	1	Bluish	0·5	Fine	16	11
"		16. 7. 5	N., F., S.	Jupiter	Blue	1·3	Fine	..	12
"		16. 7. 45	S.	Jupiter	Bluish-white	. . .	Fine	..	13
"		16. 7. 47	S.	Jupiter	Bluish-white	. . .	. . .	..	14
"		16. 9. 0	N., F.	. . .	. . .	. . .	. . .	..	15
"		16. 9. 57	F.	1	Blue	0·5	Train	..	16
"		16. 10. 57	N., F.	1	Blue	0·5	Train	4	17
"		16. 11. 15	N., F.	1	Blue	0·5	Train	5	18
"		16. 11. 17	F.	1	Blue	. . .	. . .	..	19
"		16. 11. 35	N., S.	Jupiter	Blue	1	Fine	..	20
"		16. 11. 36	S.	> 1	Bluish-white	. . .	Fine, 12^{s}.	..	21
"		16. 13. 10	F.	1	Bluish	0·5	. . .	..	22
"		16. 14. 10	S.	1	Bluish-white	. . .	Fine	..	23
"		16. 17. 5	F.	1	Bluish	. . .	. . .	..	24
"		16. 18. 20	N.	Jupiter	Blue	1·5	Train, 2^{s}.	15	25
"		16. 19. 35	F.	. . .	Blue	. . .	Fine, 30^{s}.	..	26
"		16. 20. 0	S.	1	Blue	. . .	Fine	..	27
"		16. 22. 10	N.	. . .	. . .	. . .	. . .	..	28
"		16. 22. 20	S.	Jupiter	Bluish-white	. . .	Fine	..	29
"		16. 22. 22	S.	> 1	Bluish-white	. . .	Fine, 30^{s}.	..	30
"		16. 23. 5	N.	> 1	Blue	1	Fine	10	31
"		16. 23. 50	N.	> Jupiter	Yellow	> 1	. . .	..	32
"		16. 27. 0+	N.	Large	. . .	. . .	. . .	..	33
"		16. 27. 40	N.	Very large	Blue	1	. . .	..	34
"		16. 28. 35	S.	Jupiter	Bluish-white	. . .	Fine, 3^{s}.	..	35
"		16. 30. 5	N.	> 1	Blue	1	Train	..	36
"		16. 31. 32	S.	1	Bluish-white	. . .	Fine	..	37
"		16. 34. 30	N., S.	> Mars	Green	< 1	Vapour, 8^{s}.	Stationary	38
"		16. 34. 58	N.	> 1	Blue	1·5	Train	..	39
"		16. 38. 40	S.	1	Bluish-white	. . .	. . .	..	40
"		16. 39. 30	N.	. . .	. . .	. . .	. . .	..	41
"		16. 40. 25	N., S.	Jupiter × 2	Yellowish	1·7	Fine	..	42
"		16. 43. 0†	N.	. . .	. . .	. . .	. . .	..	43
November	14	8. 54. 51	W.	Jupiter	Yellowish	1	Fine	12	44
"		9. 2. 49	W.	> Jupiter	Yellowish	1·5	Brilliant	20	45
"		9. 45. 57	W.	1	Yellowish	1	Train	30	46
"		9. 55. 5	W.	1	Bluish-white	6	Faint	130	47
"		9. 57. 19	W.	2	Bluish-white	1	None	20	48
"		10. 3. 26	W.	3	Bluish-white	0·5	None	8	49
"		10. 25. 42	W.	3	Bluish-white	0·5	None	25	50
"		10. 45. 0	N.	1	Blue	1	Train	16	51
"		10. 57. 42	W.	3	Bluish-white	1	None	10	52
"		11. 0. 0‡	F.	1	Blue	0·8	Bright	40	53
"		14. 1. 5	W.	2	Bluish-white	1	None	15	54
"		14. 1. 25	F.	. . .	Bright red	0·5	Yellowish	..	55
"		14. 5. 15	F.	1	Bluish	. . .	Short	8	56
"		14. 7. 22	W.	1	Bluish-white	1	None	Short	57
"		14. 9. 33	N.	> 1	Bluish-white	1·2	Train	12	58
"		14. 10. 31	N., W.	> Jupiter	Bluish-white	1·5	Fine, 2^{s}.	30	59
"		14. 10. 44	F.	. . .	Bluish	. . .	. . .	..	60

* November 13. From 15^{h}. to 16^{h}. the sky was overcast.

† November 13. After 16^{h}. 43^{m}. the sky remained overcast, but from that time till near daybreak (18^{h}. +) flashes of light were frequently seen, showing that large and brilliant meteors were still falling.

‡ November 14. From 11^{h}. till 14^{h}. the sky was overcast.

Number for Reference.	Path of Meteor through the Stars.
1	Low down in South below Sirius, at altitude 10°, moving from direction of Leo.
2	From a point between β and γ Cassiopeiæ towards horizon at angle of 56°.
3	From a point 1° East of preceding, with path parallel.
4	From λ Ursæ Majoris passed 2° above α and β Ursæ Majoris and parallel to those stars. Very brilliant meteor lighting up the whole sky.
5	From ε Leonis towards horizon at an angle of 20° from horizontal.
6	From ζ Draconis towards North horizon at an angle of 45°. (Sky becoming cloudy.)
7	A few degrees below place of preceding meteor, moving at inclination of 45°.
8	Seen through thin cloud in North falling at inclination of 45° towards West.
9	From direction of α Leonis to a point 3° left of α Hydræ.
10	From direction of ε Leonis to between ζ and η Ursæ Majoris.
11	From near α Leonis towards South horizon nearly vertical.
12	From direction of ξ Ursæ Majoris passed between ε and ζ Ursæ Majoris and 5° beyond.
13	From β Ursæ Majoris passed by β Ursæ Minoris.
14	From γ Ursæ Majoris passed a few degrees below β Ursæ Minoris.
15	Brilliant flash of light supposed to have been due to the bursting of a large meteor near horizon.
16	From near β Ursæ Minoris towards horizon with inclination 45°.
17	In S.S.E. at altitude 20° moving towards horizon at inclination of 15° from perpendicular to left: from direction of α Leonis.
18	Same position as preceding meteor. No stars near for reference.
19	Line of flight parallel to β and α Ursæ Majoris, moving towards Polaris.
20	From direction of α Leonis disappeared at α Hydræ.
21	From γ Leonis towards δ Cancri.
22	From near β Ursæ Minoris to near ψ Draconis.
23	From α Leonis to λ Ursæ Majoris.
24	Fell perpendicularly from a point 8° from γ Leonis.
25	Passed midway between 12 Canum Venaticorum and η Ursæ Majoris, moving from direction of ν Ursæ Majoris.
26	Across α Ursæ Majoris towards Polaris. Center of track α Ursæ Majoris.
27	From Pollux towards β Tauri.
28	Very brilliant flash of bluish-white light in East like lightning: probably due to a large meteor bursting.
29	From α Ursæ Majoris towards horizon.
30	From Capella fell nearly vertically.
31	From ζ Ursæ Majoris at angle of 45° towards North. (Sky cloudy.)
32	Very large yellow globe in N.E. lighting up the sky for more than 1 second. (Sky cloudy.)
33	Four meteors flashing behind clouds.
34	Very brilliant meteor in S.W. seen through cloud and completely illuminating the sky. (No stars visible.)
35	From direction of α Leonis passed between β and γ Ursæ Majoris.
36	From direction of ε Ursæ Majoris moved at angle of about 45° towards N., path if produced backward would cut ψ Ursæ Majoris.
37	From Capella fell towards North horizon at an angle of 35°.
38	Burst at a spot midway between γ Leonis and Mars. No apparent motion.
39	Passed from direction of γ Leonis (starting point 5° above Mars) towards α Geminorum.
40	From direction of α Leonis towards β Ursæ Majoris.
41	Very brilliant flash, sky cloudy.
42	Fell almost perpendicularly in S.S.E. from direction of α Leonis; suddenly extinguished.
43	Several indistinct flashes of light in different directions; sky generally overcast.
44	From ν Persei fell to μ Aurigæ.
45	From *d* Ursæ Majoris pursued a path almost parallel to *h* and *v* Ursæ Majoris towards horizon.
46	From direction of β Tauri passed parallel to ο and ζ Persei.
47	Appeared about 3° above α Ursæ Majoris, passed about 1° above α Cephei, and disappeared near β Pegasi.
48	From *c* Camelopardali towards ο Ursæ Majoris.
49	From ε Aurigæ, passed 3° below *d* Camelopardali.
50	From a point about 2° above ζ Tauri towards μ Tauri.
51	Fell nearly perpendicularly from ε Tauri towards horizon.
52	From *m* Lyncis passed midway between ι and κ Ursæ Majoris.
53	From near Pollux towards ε Orionis.
54	From near *f* Sextantis towards α Hydræ.
55	From near Sirius towards, but below ε Orionis.
56	From a point near γ Ursæ Majoris towards 12 Canum Venaticorum.
57	From near *f* Sextantis moved towards α Hydræ.
58	From direction of ψ Ursæ Majoris disappeared close to 12 Canum Venaticorum.
59	From direction of ν Ursæ Majoris towards η Ursæ Majoris.
60	From a point below η Ursæ Majoris towards δ Draconis.

Month and Day, 1868.		Greenwich Mean Solar Time.	Observer.	Apparent Size of Meteor in Star-Magnitudes.	Colour of Meteor.	Duration of Meteor in Seconds of Time.	Appearance and Duration of Train.	Length of Meteor's Path in Degrees.	Number for Reference.
		h m s						°	
November	14	14. 13. 55	F.	. . .	Bluish	..	. . .	10	1
	„	14. 14. 58	N.	1	Bluish-white	0·7	Train	5	2
	„	14. 15. 53	W.	Jupiter	Yellowish	1·5	Train	15	3
	„	14. 23. 14	W.	1	Bluish-white	1	None	20	4
	„	14. 25. 24	N.	3	Bluish-white	0·4	None	5	5
	„	14. 25. 55	W.	1	Yellowish	1	Train	15	6
	„	14. 27. 57	N.	1	Bluish-white	0·7	Train	6	7
	„	14. 31. 55*	W.	1	Bluish-white	1·5	None	35	8
November	15	8. 43. 0	S.	1	Bluish-white	..	Fine	..	9
December	3	5. 58. 0	N.	1	White	1·6	Faint	15	10
December	10	9. 31. 0	S.	1	Bluish-white	..	None	..	11
	„	10. 4. 0	N.	3	. . .	1	None	10	12
	„	11. 21. 0	S.	1	Bluish-white	..	Fine	..	13
	„	11. 22. 50	G. B. A.	> Jupiter	Brilliant blue	2	None	..	14
December	11	7. 50. 0	N.	1	White	0·3	None	10	15
	„	7. 50. 30	N.	> 1	White	0·7	None	12	16
	„	8. 27. 0	N.	1	White	0·4	. . .	3	17
	„	8. 30. 15	N.	Jupiter	White	1·5	Faint	20	18
December	13	10. 25. 46	W.	Jupiter	Yellowish	1·5	Slight	25	19
December	16	5. 59. 50	W.	3	Bluish-white	0·5	None	10	20
	„	6. 0. 15	W.	2	Bluish-white	1	None	15	21
	„	8. 53. 42	W.	2	Bluish-white	1	None	10	22
	„	9. 19. 12	S.	1	Bluish-white	1·5	Slight	..	23
	„	9. 26. 0	S.	1	Bluish-white	2	. . .	..	24
December	17	11. 28. 0	L.	. . .	Reddish	5	None	..	25

* November 14. The sky became overcast at $14^{h}. 40^{m}.$ and remained clouded throughout the night.

Number for Reference.	Path of Meteor through the Stars.
1	From a point above α and β Ursæ Majoris moved towards δ Draconis.
2	Directed from α Cancri passed 10° to right of α Hydræ at angle of 45°.
3	From direction of α Hydræ towards 15 Argûs.
4	From a point a little above *e* Argûs towards *n* Argûs.
5	Directed from 40 Lyncis to β Geminorum.
6	From a point slightly to right of α Cancri, disappeared a little to right of ο Leonis.
7	From direction of α Leonis passed across *f* Sextantis.
8	From direction of δ Orionis towards ο Ceti.
9	From α Persei towards β Tauri.
10	From direction of γ Arietis passed about 10° below Jupiter, disappearing near ζ Ceti.
11	From β Ursæ Minoris to Draco.
12	From direction of α Persei towards γ Draconis.
13	From direction of α Persei passing close to the right of β Pegasi.
14	Center of course below γ Ursæ Majoris at less than half the elevation of that star above the horizon. Passed down obliquely to the left at an angle of about 50° with the vertical.
15	Across Pleiades towards Jupiter. Center of path at Pleiades.
16	From direction of Aldebaran passed across γ Eridani.
17	Across Aldebaran.
18	Passed across α Draconis towards North horizon, moving parallel to ζ and η Ursæ Majoris.
19	From a point a few degrees below ι Orionis, disappeared a little below λ Leporis.
20	Inclined. From the direction of γ Geminorum towards α Orionis.
21	Inclined. From a point about 5° left of α Orionis towards ι Orionis.
22	Inclined. From near *y* Lyncis passed close to ι Ursæ Majoris.
23	From direction of θ Aurigæ, passing across θ Ursæ Majoris.
24	Appeared between θ and γ Tauri, fell vertically past ζ Orionis.
25	Passed from near Pollux, between Ursa Major and Leo, and disappeared close to 12 Canum Venaticorum.